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ABRIDGED DICTIONARY OF
THE ENGLISH LANGUAGE
UNDER ONE ALPHABET

IN FORTY VOLUMES

VOLUME 5
BILLET—BRAVE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables: (ˈ), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
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<i>ā</i> ...	mate, fate, fail, aye.....	<i>māt, fāt, fāl, ā.</i>
<i>ă</i> ...	mat, fat.....	<i>măt, făt.</i>
<i>â</i> ...	far, calm, father.....	<i>fâr, kâm, fâ'ther.</i>
<i>ă</i> ...	care, fair.....	<i>câr, fâr.</i>
<i>aw</i> ...	fall, laud, law.....	<i>fawl, lawd, law.</i>
<i>ē</i> ...	mete, meat, feet, free.....	<i>mēt, mêt, fêt, frē.</i>
<i>ě</i> ...	met, bed.....	<i>mět, běd.</i>
<i>é</i> ...	her, stir, heard, cur.....	<i>hēr, stēr, hērd, kēr.</i>
<i>î</i> ...	pine, ply, height.....	<i>pîn, plî, hît.</i>
<i>ï</i> ...	pin, nymph, ability.....	<i>pîn, nîmf, â-bîl'î-tî.</i>
<i>ō</i> ...	note, toll, soul.....	<i>nōt, tōl, sōl.</i>
<i>ö</i> ...	not, plot.....	<i>nōt, plōt.</i>
<i>ô</i> ...	move, smooth.....	<i>môv, smôth.</i>
<i>ö</i> ...	Goethe (similar to <i>e</i> in her)...	<i>gö'teh.</i>
<i>ow</i> ...	noun, bough, cow.....	<i>noun, bow, kow.</i>
<i>oy</i> ...	boy, boil.....	<i>boy, boyl.</i>
<i>û</i> ...	pure, dew, few.....	<i>pûr, dû, fû.</i>
<i>ũ</i> ...	bud, come, tough.....	<i>bũd, kũm, tũf.</i>
<i>ú</i> ...	full, push, good.....	<i>fûl, pûsh, gûd.</i>
<i>ü</i> ...	French plume, Scotch guid.	<i>plûm, gûd.</i>

<i>ch</i> ...	chair, match.....	<i>chär, mäch.</i>
<i>êh</i> ...	German buch, Heidelberg, Scotch loch (guttural).....	<i>bôch, hî'del-bêrch, lôch.</i>
<i>g</i> ...	game, go, gun.....	<i>gām, gō, gûn.</i>
<i>j</i> ...	judge, gem, gin.....	<i>jûj, jēm, jîn.</i>
<i>k</i> ...	king, cat, cot, cut.....	<i>kîng, kăt, kōt, kût.</i>
<i>s</i> ...	sit, scene, cell, city, cypress.....	<i>sît, sên, sêl, sît'î, sî'prēs.</i>
<i>sh</i> ...	shun, ambition.....	<i>shûn, âm-bîsh'ûn.</i>
<i>th</i> ...	thing, breath.....	<i>thîng, brêth.</i>
<i>th</i> ...	though, breathe.....	<i>thō, brêth.</i>
<i>z</i> ...	zeal, maze, muse.....	<i>zêl, mâz, mûz.</i>
<i>zh</i> ...	azure, vision.....	<i>âzh'er, vîzh'ûn.</i>

ABBREVIATIONS USED IN THIS WORK.

a., or adj....adjective
A.B.Bachelor of Arts
abbrabbreviation, abbreviated
abl. or abla.ablative
Abp.....Archbishop
abt.....about
Acad.....Academy
acc. or ac. accusative
accom.....accommodated, accommodation
actactive
A.D.in the year of our Lord [*Anno Domini*]
Adj.Adjutant
Adm.....Admiral
adv. or ad. adverb
A.F.....Anglo-French
Ag.....Silver [*Argentum*]
agri.....agriculture
A.L.....Anglo-Latin
Al.....Aluminium
Ala.....Alabama
Alb.....Albanian
alg.....algebra
A.M.....?..before noon [*ante meridiem*]
A.M.Master of Arts
Am.....Amos
Amer.....America, -n
anat.....anatomy, anatomical
anc.....ancient, anciently
A.N.M.in the year of the world [*Anno Mundi*]
anon.....anonymous
antiqu.....antiquity, antiquities
aor.....aorist, -ic
app.....appendix
appar.....apparently
Apr.....April
Ar.....Arabic
arch.....architecture
archæol...archæology
arith.....arithmetical
Ark.....Arkansas
art.....article
artil.....artillery
AS.....Anglo Saxon
As.....Arsenic
Assoc.....Association
asst.....assistant
astrol.....astrology
astron... astronomy
attrib.....attributive
atty.....attorney
at. wt.....atomic weight
Au.....Gold [*Aurum*]

A.U.C.....in the year of the building of the city (Rome) [*Annourbis conditæ*]
Aug.....August
aug.....augmentative
Aust.....Austrian
A.V.....authorized version [of Bible, 1611]
avoir.....avoirdu pois
B.....Boron
B.....Britannic
b.....born
Ba.....Barium
Bart.....Baronet
Bav.....Bavarian
bl.; bbl....barrel; barrels
B.C.....before Christ
B.C.L.... Bachelor of Civil Law
B.D.....Bachelor of Divinity
bef.....before
Belg.....Belgie
Beng.....Bengali
Bi.....Bismuth
biog.....biography, biographical
*biol.....biology
B.L.....Bachelor of Laws
Bohem.....Bohemian
bot.....botany, botanical
Bp.....Bishop
Br.....Bromine
Braz.....Brazilian
Bret.....Breton
Brig.....Brigadier
Brit.....British, Britannica
bro.....brother
Bulg.....Bulgarian
bush.....busbel, bushels
C.....Carbon
c.....century
Ca.....Calcium
Cal.....California
Camb.....Cambridge
Can.....Canada
Cant.....Canterbury
cap.....capital
Capt.....Captain
Card.....Cardinal
carp.....carpentry
Cath.....Catholic
caus.....causative
cav.....cavalry
Cd.....Cadmium
Ce.....Cerium
Celt.....Celtic
cent.....central
cf.....compare [*confer*]
ch or chh...church

ABBREVIATIONS.

Chal.....	Chaldee	diff.....	different, difference
chap.....	chapter	dim.....	diminutive
chem.....	chemistry, chemical	dist.....	district
Chin.....	Chinese	distrib.....	distributive
Chron.....	Chronicles	div.....	division
chron.....	chronology	doz.....	dozen
Cl.....	Chlorine	Dr.....	Doctor
Class.....	Classical [= Greek and Latin]	dr.....	dram, drams
Co.....	Cobalt	dram.....	dramatic
Co.....	Company	Dut. or D.....	Dutch
co.....	county	dwt.....	pennyweight
cog.....	cognate [with]	dynam or	
Col.....	Colonel	dyn.....	dynamics
Col.....	Colossians	E.....	Erbium
Coll.....	College	E. or e.....	East, -ern, -ward
colloq.....	colloquial	E. or Eng.....	English
Colo.....	Colorado	Eccl.....	Ecclesiastes
Com.....	Commodore	eccl. or	} ecclesiastical [af-
com.....	commerce, commercial	eccles.....	
com.....	common	ed.....	edited, edition, editor
comp.....	compare	e.g.....	for example [ex gratia]
comp.....	composition, compound	E. Ind. or }	East Indies, East
compar.....	comparative	E. I.....	} Indian
conch.....	conchology	elect.....	electricity
cong.....	congress	Emp.....	Emperor
Congl.....	Congregational	Encyc.....	Encyclopedia
conj.....	conjunction	Eng. or E.....	English
Conn or Ct.....	Connecticut	engin.....	engineering
contr.....	contraction, contracted	entom.....	entomology
Cop.....	Coptic	env. ext.....	envoy extraordinary
Cor.....	Corinthians	ep.....	epistle
Corn.....	Cornish	Eph.....	Ephesians
corr.....	corresponding	Episc.....	Episcopal
Cr.....	Chromium	eq. or =.....	equal, equals
crystal.....	crystallography	equiv.....	equivalent
Cs.....	Cæsium	esp.....	especially
ct.....	cent	Est.....	Esther
Ct. or Conn.....	Connecticut	estab.....	established
Cu.....	Copper [Cuprum]	Esthon.....	Esthonian
cwt.....	a hundred weight	etc.....	and others like [et cetera]
Cyc.....	Cyclopedia	Eth.....	Ethiopic
D.....	Didymium	ethnog.....	ethnography
D. or Dut.....	Dutch	ethnol.....	ethnology
d.....	died	et seq.....	and the following [et sequentia]
d. [l. s. d.].....	penny, pence	etym.....	etymology
Dan.....	Daniel	Eur.....	European
Dan.....	Danish	Ex.....	Exodus
dat.....	dative	exclam.....	exclamation
dau.....	daughter	Ezek.....	Ezekiel
D. C.....	District of Columbia	Ezr.....	Ezra
D.C.L.....	Doctor of Civil [or Common] Law	F.....	Fluorine
D.D.....	Doctor of Divinity	F. or Fahr.....	Fahrenheit
Dec.....	December	f. or fem.....	feminine
dec.....	declension	F. or Fr.....	French
def.....	definite, definition	fa.....	father
deg.....	degree, degrees	Fahr. or F.....	Fahrenheit
Del.....	Delaware	far.....	farriery
del.....	delegate, delegates	Fe.....	Iron [Ferrum]
dem.....	democratic	Feb.....	February
dep.....	deputy	fem or f.....	feminine
dep.....	deponent	fig.....	figure, figuratively
dept.....	department	Fin.....	Finnish
deriv.....	derivation, derivative	F.—L.....	French from Latin
Deut.....	Deuteronomy	Fla.....	Florida
dial.....	dialect, dialectal	Flem.....	Flemish
diam.....	diameter	for.....	foreign
Dic.....	Dictionary	fort.....	fortification
		Fr. or F.....	French
		fr.....	from

ABBREVIATIONS.

fi	...requentative	ind	...indicative
Fris	....Frisian	indef	....indefinite
ft	.....foot, feet	Indo-Eur	...Indo-European
fut	.....future	inf	....infantry
G. or Ger	...German	inf or infin	...infinitive
G	.....Glucinium	instr	....instrument, -al
Ga	.....Gallium	int	....interest
Ga	.....Georgia	intens	....intensive
Gael	.....Gaelic	interj. or	
Gal	.....Galatians	int	....interjection
gal	.....gallon	interrog	...interrogative pro-
galv	....galvanism, galvanic		noun
gard	....gardening	intr. or	
gen	....gender	intrans	...intransitive
Gen	....General	Io	.....Iowa
Gen	....Genesis	Ir	.....Iridium
gen	....genitive	Ir	.....Irish
Geno	....Genoese	Iran	....Iranian
geog	....geography	irr	....irregular, -ly
geol	....geology	Is	.....Isaiah
geom	....geometry	It	....Italian
Ger	....German, Germany	Jan	....January
Goth	....Gothic	Jap	....Japanese
Gov	....Governor	Jas	....James
govt	....government	Jer	....Jeremiah
Gr	....Grand, Great	Jn	....John
Gr	....Greek	Josh	....Joshua
gr	....grain, grains	Jr	....Junior
gram	....grammar	Judg	....Judges
Gr. Brit	...Great Britain	K	....Potassium [<i>Kalium</i>]
Gris	....Grisons	K	....Kings [in Bible]
gun	....gunnery	K	....king
H	....Hegira	Kan	....Kansas
H	....Hydrogen	Kt	....Knight
h	....hour, hours	Ky	....Kentucky
Hab	....Habakkuk	L	....Latin
Hag	....Haggai	L	....Lithium
H. B. M.	...His [or Her] Britan- nic Majesty	l. [l. s. d.],	{ pound, pounds
Heb	....Hebrew, Hebrews	or £	} [sterling]
her	....heraldry	La	....Lanthanum
herpet	....herpetology	La	....Louisiana
Hg	....Mercury [<i>Hydrar- gyrum</i>]	Lam	....Lamentations
hhd	....hogshead, hogsheads	Lang	....Languedoc
Hind	....Hindustani, Hindu, or Hindi	lang	....language
hist	....history, historical	Lap	....Lapland
Hon	....Honorable	lat	....latitude
hort	....horticulture	lb.; llb. or	{ pound : pounds
Hos	....Hosea	lbs	} [weight]
Hung	....Hungarian	Let	....Lettish
Hydros	....Hydrostatics	Lev	....Leviticus
I	....Iodine	LG	....Low German
I; Is	....Island ; Islands	L.H.D.	....Doctor of Polite Lit- erature
Icel	....Icelandic	Lieut	....Lieutenant
ichth	....ichthyology	Lim	....Limousin
Ida	....Idaho	Lin	....Linnæus, Linnæan
i.e.	....that is [<i>id est</i>]	lit	....literal, -ly
Ill	....Illinois	lit	....literature
illus	....illustration	Lith	....Lithuanian
impera or		lithog	....lithograph, -y
impr	....imperative	LL	....Late Latin, Low Latin
impers	....impersonal	LL.D.	....Doctor of Laws
impf or imp	imperfect	long	....longitude
impf. p. or		Luth	....Lutheran
imp	....imperfect participle	M	....Middle
improp	....improperly	M	....Monsieur
In	....Indium	m	....mile, miles
in	....inch, inches	m. or masc	...masculine
incept	....inceptive	M.A.	....Master of Arts
Ind	....India, Indian	Macc	....Maccabees
Ind	....Indiana	mach	....machinery
		Mag	....Magazine

ABBREVIATIONS.

Maj... Major
 Mal... Malachi
 Mal... Malay, Malayan
 manuf... manufacturing, manufacturers
 Mar... March
 masc or m. masculine
 Mass... Massachusetts
 math... mathematics, mathematical
 Matt. Matthew
 M.D. Doctor of Medicine
 M.D. Middle Dutch
 Md. Maryland
 ME. Middle English, or Old English
 Me. Maine
 mech. mechanics, mechanical
 med. medicine, medical
 mem. member
 mensur. mensuration
 Messrs. or
 MM. Gentlemen, Sirs
 metal. metallurgy
 metaph. metaphysics, metaphysical
 meteor. meteorology
 Meth. Methodist
 Mex. Mexican
 Mg. Magnesium
 M.Gr. Middle Greek
 MHG. Middle High German
 Mic. Micah
 Mich. Michigan
 mid. middle [voice]
 Milan. Milanese
 mid. L. or } Middle Latin, Medieval Latin
 ML. {
 milit. or
 mil. military [affairs]
 min. minute, minutes
 mineral. mineralogy
 Minn. Minnesota
 Min. Plen. Minister Plenipotentiary
 Miss. Mississippi
 ML. or } Middle Latin, Medieval Latin
 mid. L. {
 MLG. Middle Low German
 Mlle. Mademoiselle
 Mme. Madam
 Mn. Manganese
 Mo. Missouri
 Mo. Molybdenum
 mod. modern
 Mont. Montana
 Mr. Master [Mister]
 Mrs. Mistress [Missis]
 MS.; MSS. manuscript; manuscripts
 Mt. Mount, mountain
 mus. music
 MUS.DOC. Doctor of Music
 myth. mythology, mythological
 N. Nitrogen
 N. or n. North, -ern, -ward
 n. noun
 n or neut. neuter
 Na. Sodium [*Natrium*]
 Nah. Nahum

N. A., or
 N. Amer. North America, -n
 nat. natural
 naut. nautical
 nav. navigation, naval affairs
 Nb. Niobium
 N. C. or
 N. Car. North Carolina
 N. D. North Dakota
 Neb. Nebraska
 neg. negative
 Neh. Nehemiah
 N. Eng. New England
 neut or n. neuter
 Nev. Nevada
 N.Gr. New Greek, Modern Greek
 N. H. New Hampshire
 NHG. New High German [German]
 Ni. Nickel
 N. J. New Jersey
 NL. New Latin, Modern Latin
 N. Mex. New Mexico
 N. T., or
 N. Test. New Testament
 N. Y. New York [State]
 nom. nominative
 Norm. F. Norman French
 North. E. Northern English
 Norw. Norwegian, Norse
 Nov. November
 Num. Numbers
 numis. numismatics
 O. Ohio
 O. Old
 O. Oxygen
 Obad. Obadiah
 obj. objective
 obs. or †. obsolete
 obsoles. obsolescent
 O.Bulg. Old Bulgarian or Old Slavic
 Oct. October
 Odontog. odontography
 OE. Old English
 OF or
 O. Fr. Old French
 OHG. Old High German
 Ont. Ontario
 opt. optics, optical
 Or. Oregon
 ord. order
 ord. ordnance
 org. organic
 orig. original, -ly
 ornith. ornithology
 Os. Osmium
 OS. Old Saxon
 O. T., or
 O. Test. Old Testament
 Oxf. Oxford
 oz. ounce, ounces
 P. Phosphorus
 p.; pp. page; pages
 p., or part. participle
 Pa. or Penn. Pennsylvania
 paint. painting
 palæon. palæontology
 parl. parliament
 pass. passive

ABBREVIATIONS.

pathol or
 path.....pathology
 Pb.....Lead [*Plumbum*]
 Pd.....Palladium
 Penn or Pa. Pennsylvania
 perf.....perfect
 perh.....perhaps
 Pers.....Persian, Persic
 pers.....person
 persp.....perspective
 pert.....pertaining [to]
 Pet.....Peter
 Pg. or Port. Portuguese
 phar.....pharmacy
 PH.D.....Doctor of Philoso-
 phy
 Phen.....Phenician
 Phil.....Philippians
 Philem.....Philemon
 philol.....philology, philologi-
 cal
 philos. { philosophy, philo-
 or phil... } sophical
 phonog.....phonography
 photog.....photography
 phren.....phrenology
 phys.....physics, physical
 physiol... physiology, physi-
 ological
 Pied.....Piedmontese
 Pl.....Plate
 pl. or plu...plural
 Pl. D.....Platt Deutsch
 plupf.....pluperfect
 P.M.....afternoon [*post meri-
 diem*]
 pneum.....pneumatics
 P. O.....Post-office
 poet.....poetical
 Pol.....Polish
 pol econ...political economy
 polit.....politics, political
 pop.....population
 Port. or Pg. Portuguese
 poss.....possessive
 pp.....pages
 pp.....past participle, per-
 fect participle
 p. pr.....present participle
 Pr. or Prov. Provengal
 pref.....prefix
 prep.....preposition
 Pres.....President
 pres.....present
 Presb.....Presbyterian
 pret.....preterit
 prim.....primitive
 priv.....privative
 prob.....probably, probable
 Prof.....Professor
 pron.....pronoun
 pron.....pronunciation, pro-
 nounced
 prop.....properly
 pros.....prosody
 Prot.....Protestant
 Prov. or Pr. Provengal
 Prov.....Proverbs
 prov.....province, provincial
 Prov. Eng. Provincial English
 Prus.....Prussia. -n
 Ps.....Psalm, Psalms
 psychol...psychology

pt.....past tense
 pt.....pint
 Pt.....Platinum
 pub.....published, publisher,
 publication
 pwt.....penny weight
 Q.....Quebec
 qt.....quart
 qtr.....quarter [weight]
 qu.....query
 q.v.....which see [*quod
 vide*]
 R.....Rhodium
 R.....River
 Rb.....Rubidium
 R. Cath....Roman Catholic
 rec. sec...recording secretary
 Ref.....Reformed
 refl.....reflex
 reg.....regular. -ly
 regt.....regiment
 rel. pro. or
 rel.....relative pronoun
 repr.....representing
 repub.....republican
 Rev.....Revelation
 Rev.....The Reverend
 Rev. V.....Revised Version
 rhet.....rhetoric, -al
 R. I.....Rhode Island
 R. N.....Royal Navy
 Rom.....Roman, Romans
 Rom.....Romanic or Ro-
 mance
 Rom. Cath. { Roman Catholic
 Ch. or R { Church
 C. Ch.... }
 r.r.....railroad
 Rt. Rev...Right Reverend
 Ru.....Ruthenium
 Russ.....Russian
 r.w.....railway
 S.....Saxon
 S.....Sulphur
 s.....second, seconds
 s. [l. s. d.]..shilling, shillings
 S. or s.....South, -ern, -ward
 S. A. or
 S. Amer..South America, -n
 Sam.....Samaritan
 Sam.....Samuel
 Sans, or
 Skr.....Sanskrit
 Sb.....Antimony [*Stibium*]
 s.c.....understand, supply,
 namely [*scilicet*]
 S. C. or
 S. Car....South Carolina
 Scand.....Scandinavian
 Scot.....Scotland, Scotch
 scr.....scruple, scruples
 Scrip.....Scripture [s], Scrip-
 tural
 sculp.....sculpture
 S. D.....South Dakota
 Se.....Selenium
 sec.....secretary
 sec.....section
 Sem.....Semitic
 Sep.....September
 Serv.....Servian
 Shaks....Shakespeare
 Si.....Silicon

ABBREVIATIONS.

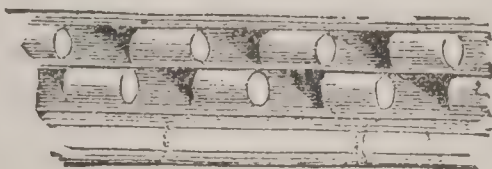
Sic.....	Sicilian	trigon.....	trigonometry
sing.....	singular	Turk.....	Turkish
sis.....	sister	typog.....	typography, typo- graphical
Skr. <i>or</i>		U.....	Uranium
Sans.....	Sanskrit	ult.....	ultimate, -ly
Slav.....	Slavonic, Slavic	Unit.....	Unitarian
Sn.....	Tin [<i>Stannum</i>]	Univ.....	Universalist
Soc.....	Society	Univ.....	University
Song Sol...	Song of Solomon	U. Presb...	United Presbyterian
Sp.....	Spanish	U. S....	United States
sp. gr.....	specific gravity	U. S. A....	United States Army
sq.....	square	U. S. N....	United States Navy
Sr.....	Senior	Ut.....	Utah
Sr.....	Strontium	V.....	Vanadium
....	Saint	v.....	verb
....	street	Va.....	Virginia
stat.....	statute	var.....	variant [word]
s.T.D.....	Doctor of Sacred Theology	var.....	variety of [species]
subj.....	subjunctive	Ven.....	Venerable
suf.....	suffix	Venet.....	Venetian
Su. Goth...	Suo-Gothic	vet....	veterinary
superl ..	superlative	v. i. <i>or</i>	
Supp.....	Supplement	v. intr...	verb intransitive
Supt ..	Superintendent	vil.....	village
surg.....	surgery, surgical	viz.....	namely, to-wit [<i>vide-</i> <i>licet</i>]
Surv.....	surveying	v. n.....	verb neuter
Sw.....	Swedish	voc.....	vocative
Swab.....	Swabian	vol.....	volume
sym.....	symbol	vols.....	volunteers
syn.....	synonym, -y	Vt.....	Vermont
Syr.....	Syriac, Syrian	v. tr.....	verb transitive
t.....	town	W.....	Tungsten [<i>Wolfram</i>]
Ta....	Tantalum	W.....	Welsh
Tart.....	Tartar	W. <i>or</i> w....	West, -ern, -ward
Te.....	Tellurium	Wal.....	Walachian
technol ..	technology	Wall.....	Walloon
teleg.....	telegraphy	Wash ..	Washington
Tenn.....	Tennessee	Westph...	Westphalia, -n
term.....	termination	W. Ind. }	West Indies, West
terr.....	territory	or W. I. }	Indian
Teut.....	Teutonic	Wis.....	Wisconsin
Tex.....	Texas	wt.....	weight
Th.....	Thorium	W. Va.....	West Virginia
theat	theatrical	Wyo.....	Wyoming
theol.....	theology, theological	Y.....	Yttrium
therap....	therapeutics	yd.....	yard
Thess.....	Thessalonians	yr.....	year
Ti.....	Titanium	Zech.....	Zechariah
Tim.....	Timothy	Zeph.....	Zephaniah
Tit.....	Titus	Zn.....	Zinc
Tl.....	Thallium	zool.....	zoology, zoological
toxicol ..	toxicology	Zr.....	Zirconium
tp.....	township		
tr. <i>or</i> trans.	transitive		
transl.....	translation, trans- lated		

See also ABBREVIATIONS' in Vol. I.

THE IMPERIAL CYCLOPEDIA AND DICTIONARY.

BILLET, n. *bil'let* [F. *billet*, ticket, diminutive of **BILL** 2]: a small letter; a ticket directing soldiers where to lodge: V. to quarter soldiers. **BIL'LETING**, imp. **BIL'LETED**, pp.

BILLET, n. *bil'let* [F. *billot*, a stick or log of wood cut for firewood—from *bille*, a log of wood ready for sawing into planks]: a small log of wood for firewood; in *arch.*, a kind of molding: an ornament in the Norman style. It was



Billet.

formed by cutting a molding—generally a round molding—into notches, so that the parts left resembled billets of wood. When used in several rows, the billets and empty spaces are placed interchangeably, as in the accompanying illustration.

BILLET, in Heraldry: a small oblong figure, sometimes taken to represent a brick, but more commonly *billets doux*. The latter interpretation, which is that of Guillim, is generally adopted by English heralds, and is supported by the authority of Colombiere. The former, which has the *Trésor Héraldique* and Sir George Mackenzie on its side, is strengthened by the fact that in German they are called *Schindeln*, shingles.

BILLET-DOUX, n. *bil'lā-dō'*, **BILLETS-DOUX**, n. plu. *bil'lāz-dō'*, as English pronunciation [F. *billet*, a letter; *doux*, sweet]: a short love-letter; a love-note.

BIL'LETING: in Britain, a mode of provisioning and lodging soldiers when not in camp or barrack. In the early English history, monarchs were often wont to quarter their troops on the monasteries. In later times the soldiers often compelled the inhabitants of towns to receive and support them; and the authorities were either unable or unwilling to prevent this. The Mutiny Act, 1689, put a stop to this pernicious practice, by declaring that no housekeepers should be compelled to accommodate soldiers except on some recognized and fairly administered system.

BILLIARDS.

BILLIARDS. n. plu. *bil' yérdz* [F. *billard*—from F. *bille*; L. *bulla*, a bubble, a ball (another derivation is given, with a different meaning for the F. *billard*, viz., the stick or staff with which the ball is struck; allied to *billot*, a block or billet of wood)]: a game played on a long table covered with cloth, with ivory balls and a cue or mace. BILL'IARD, a. pertaining to. The game, whether invented in France or Italy, was imported to Britain from France. It must have been known by name to Englishmen as early as the 16th c., since Shakespeare speaks of it; though, when he represents Cleopatra as amusing herself with B. in Egypt, he probably commits an anachronism. It is certain that the rectangular slate-table, with its resilient sides, covered with green cloth, and having the six brass-bound pockets, the three ivory balls, and the now familiar array of cues with leathern tops, is of quite modern production. For two centuries B. was played with only two balls: and when the third or red ball was imported from France, the winning hazard—that is to say, the holing of the red ball was almost the sole object of the performers. The cushions formerly of felt, are now of india-rubber. No other game requires such scientific combination of exactness in measuring distances, angles, and force of stroke, with such delicacy of touch and steadiness of hand.

The standard table for match games by experts in the United States, is 5 ft. by 10, but in residences and general play 4½ ft. by 9 is more usual, and 4 ft. by 8 is often seen. A room for one table should be not less than 15 ft. by 20. Light should come from overhead, and for artificial lights the height is about 3 ft 2 in. above the table-bed. The table for the Amer. four-ball game was, and still may be, 6 ft. by 12 and if pockets are used there are six, one at each corner and two at the middle of each of the longest sides. The other material for use in the game comprises balls of ivory or celluloid, of different colors, red and white being used alone in the ordinary three-ball game; the cues, are long, carefully made, smooth sticks, having one end thick and the other tapering, the small end being covered with leather, which is chalked when in use. There are also maces, which are slender sticks with a cap fastened at one end, and designed for pushing; and the bridge, which is a long stick having at one end a grooved piece of wood on which to rest the cue when the distance from the side prevents the easy use of the hand as a rest. Of the white balls, one has a small spot for distinction, the other being plain. At about a foot from one end of the table, exactly in its centre, there is a mark on the cloth on which the red ball is placed before commencing the game. At the lower end of the table, and about two ft. from it, a line is considered as drawn across the table, from within which the player sends his ball. In the pocket game the object of the player is, by striking his own ball against the red ball or his adversary's, to send one or both of them into the pockets, or to make a carom or cannon by striking both balls with his own. The pocket game has, however, gone out of fashion in America. The tables in use are there-

BILLIARDS.

fore without pockets, and the game now most popular is the French carom game or the three-ball carom game.

The American, or four-ball game, is played with two colored ball and two white balls (one having a small spot). The scores are made by winning hazards and caroms. The carom from a white to a colored ball counts two; from one to another colored ball three points. Three points are also taken for each colored ball pocketed and two points for the white ball. At the commencement of the game one colored ball is placed on the winning spot and the other on the centre spot on the balk line. The non-player places his ball on the 'spot,' and the striker at starting either hits it or gives a miss. The game may be played for any number of points.

In learning the game the first object to understand is the form of the bridge or support upon which the cue is to act. This is made by placing the left hand of the player firmly upon the table at the distance of six or nine inches from the ball which is to be struck, if practicable, the hand being drawn up until it rests only upon the wrist and the points of the fingers, the palm being hollowed and the thumb elevated above the knuckles, forming a furrow between it and the forefinger for the cue to slide in. The cue is grasped four or five inches from the butt with the right hand, when the player's ball is struck either in the centre or on one side, according to the character of the stroke desired. The method of delivering a ball to effect a shot can be learned only by experience, while a fine mathematical eye is essential in calculating the angles and estimating distances, and a peculiar and almost instinctive perception of the exact force necessary to give is requisite in order to provide also for leaving the balls in the best position for future play.

Rules of the American or Four-ball Game.—1. The game begins by stringing for the lead, and the player who, after striking his ball to the bottom cushion, brings it nearest to the cushion at the upper end of the table, wins the choice of lead and balls.

2. If, after the first player has struck for lead, his opponent make his ball touch any other ball, or if he pocket his own, he loses thereby his choice.

3. If the striker play with the wrong ball during the game it is deemed a foul stroke, and consequently he cannot count; provided the mistake be discovered before the second stroke is made. But if more than one stroke be made with the wrong ball without discovery the player is entitled to all the points which he may have counted up to the time of discovery, and may continue his play.

4. If the balls of both the players happen to be in hand at the same time, and he whose play it is should through mistake, obtain his opponent's ball, and play with it under the impression that he was using his own, he is entitled to all the points he may make, and no penalty attaches to him for the mistake.

5. If a ball be discovered to have been changed during the game, and it cannot be ascertained by which player,

the game must be played to the end, with the balls as they are.

6. If the striker be about to play with the wrong ball, no person, not even the marker, has a right to disclose his error; but in a double match his partner only is justified in doing so.

7. If the player, while in the act of striking his ball, touch it twice with his instrument the stroke is considered foul.

8. In playing with the butt of the cue the striker must withdraw it from his ball before such ball comes in contact with the object-ball.

9. The player has a right to use the bridge, or any other instrument pertaining to the game, at any stage of the play, unless it is otherwise stipulated in the commencement.

10. If the striker, by accident, make his ball touch the other while the balls are very near each other, it is considered a stroke, though not intended as such. But if a player, in the act of striking, be baffled or impeded by his opponent or a spectator, he has a right to replace the balls, and recommence the stroke; and any points made after the ball has been so replaced are good and must be counted.

11. If any person play at a ball while it or any other ball is rolling, the stroke is considered foul, and he is not entitled to any count he may have effected by such play.

12. If the striker, after having made a hazard or carom, interrupt the course of his or any other ball the stroke is foul, and he cannot score the points he may have made.

13. After a red ball has been pocketed, or forced off the table, the striker is bound to see the ball placed on the proper spot again—provided such spot be vacant before he strikes, for otherwise he can win no points while the ball is out of its place.

14. If the striker play with the wrong ball, and at the same time make a miss, or pocket it, he cannot score such count; but, on the contrary, the same penalty attaches to him as if he had played with his own ball.

15. When a red ball cannot be placed on its proper spot, it must remain off the table until that spot becomes vacant, and the ball cease rolling.

16. If the striker's ball, standing at the edge of a pocket, fall into that pocket before the striker has delivered his ball from the instrument, so as to leave him no chance for a stroke, the ball must be replaced in its original position, and the player is entitled to repeat his stroke.

17. If the object-ball fall into a pocket before the player's ball, after being delivered from the instrument, can reach it, the rule is the same as above; both balls must be replaced as nearly as possible in their original position, and the stroke repeated.

18. If a player's ball, when it is his play, be in contact with another ball, he cannot count; but it is imperative on him to make such play as will separate the balls, and in this case he loses no point unless he pocket his ball or cause it to jump off the table, and then he loses as in ordinary cases.

BILLIARDS.

19. When the player has once separated the balls to the extent of one inch, it is not imperative on him to separate them a second time, though it is quite possible that they may roll together and come in contact after the stroke is made.

20. If, during the game, a ball happen to jump off the bed of the table and lodge on the cushion it is to be considered off the table; and if a red ball it must be placed on its appropriate spot; but if it be the player's ball he forfeits as many points as if he had pocketed it.

21. When the striker's ball is in hand he can play from any point within the string, but it is imperative on him to play his ball outside the string, and he can gain no points unless it is played out or passes beyond the string.

22. If the striker's ball be in hand, and the other balls within the string, and if he—either by accident or design—strike any of them without first playing out of the string, it is optional with his opponent to let the balls remain as they are; to have them replaced in their original positions, or to compel the striker to play the stroke again.

23. If the striker's ball be in hand, and he play at the cushion within the string, for the purpose of striking any ball, he is not entitled to any count which he may effect by such play, and the opponent has the same option as in Rule 22.

24. If a ball spring off the table and strike one of the players or bystanders, and be thereby caused to fall back on the table, it is considered as much off the table as if it had fallen to the floor, and any count it may have effected cannot be scored by the player.

25. If the marker or any bystander touch either of the balls, whether it be rolling or stationary, it must be placed as near as possible to the position it would apparently have occupied if it had not been interfered with.

26. No person has a right to take up or remove a ball without the permission of his opponent.

27. No person has a right to disclose whether a stroke be fair or foul until solicited; and in playing a double match none but the opponents of the player have a right to inquire.

28. The striker can lose only two points by pocketing his own ball, or causing it to jump off the table, provided his own came in contact with a white ball in such stroke before it entered the pocket, regardless of the points he would have made if he had completed his play.

29. A carom on all the balls counts five irrespective of the particular balls which are struck first or last.

30. The opponent is always bound to see if the striker play fair, which, if he neglect to do, the striker wins all the points he may have made by that particular stroke, and the marker is obliged to score them.

31. Each party must take care of his own game, and his opponent has no right to answer any questions—such as: 'Is the ball in or out?' 'Do the balls touch?' And such like. These, and similar circumstances, the player should discover for himself.

BILLIARDS.

32. No person has any right to disclose to the player, by hint or innuendo, the manner in which he should play his ball to the greatest advantage.

33. Neither, after a stroke has been played, has any one a right to disclose or comment upon any error the player may have committed, as a stroke of the same kind may occur again in the same game.

34. The striker has a right to demand that his opponent shall not stand facing him or near him, so as to annoy him or molest him in his strokes; and if his opponent persist in so doing, after being remonstrated with, the aggrieved party is justified in throwing up the game, and such game shall be considered drawn.

35. He who leaves the game before it is finished, and refuses to play it out, loses that game, although he may have made but one stroke; unless he leave for causes mentioned in Rule 34.

36. The striker is not entitled to any point unless one foot, at least, is on the floor while the stroke is being made.

37. In a four-handed match, whenever the striker makes a hazard, he puts out his opponent—consequently the opponent's partner takes his place.

38. In a four-handed match, if the striker pocket his own ball, or make two misses in succession, his hand is out and his partner takes his place.

39. In a three-handed game the players commence by stringing for the lead, and he who brings his ball nearest to the upper cushion wins the choice of lead and balls; and he who brings his ball the next nearest to the cushion is the player with him; the third player must wait until the third hazard is made or two misses in succession.

40. In a three-handed game he who makes sixty-six points first is out; the other two players continue until the hundred is played out.

41. If the striker cause his opponents to become sixty-six points each, by a forfeiture, neither of the parties can claim game on the strength of his forfeiture, and can win it only by their next count.

42. The first person who makes sixty-six points ceases all play, and he whose hand is out plays on with that player's ball, as that ball is entitled to have its run out.

43. If the player pocket his own ball, or make a miss, it counts for both his opponents.

44. If a player make two misses in succession, or pocket his own ball, or cause it to jump off the table, his hand is out.

45. If a dispute arise between the players concerning the fairness of the stroke, the marker alone is authorized to decide the question; but if he be incompetent to make the required decision he should inquire the particulars of the case from the disinterested company present, and, upon demanding silence, should go round the table to each person separately and ask if he understands the game and the nature of the dispute in question; and the majority of the disinterested company then present, and so interrogated is to decide the dispute.

BILLIARDS.

46. If a decision be given contrary to the spirit and intent of these rules, the aggrieved party can notify his opponent of his intention to appeal from it (this notification, however, must precede the next stroke, otherwise the original decision holds good) and if, at the conclusion of the game, the party against whom the decision was given be the loser, and can prove it to have been wrong, he can claim a draw game.

47. Every person before entering the door of a billiard room, during a game, should be attentive and listen for the stroke, that he may not interrupt or confuse a player in the act of playing.

48. The duties of a game-keeper are: to spot the ball when pocketed, to call each count distinctly and loud enough for the players to hear him, to mark up the numbers made by each player immediately after he completes his run and before the next player can commence his stroke, and to see that all but the players stand away from the table, that the players may have room to pass freely around.

Three-ball (French) Game.—The three-ball carom game is played with two white balls (one with a spot) and one red ball. The billiard table has three spots in a line dividing the table lengthwise, running from the centre of the head cushion to the centre of the foot cushion; one of those spots, cutting the line in two equal parts, is called the *centre spot*, and the other two are situated half-way between the centre spot and the head and foot cushions.

The spot at the head of the table is called the *white spot*, and the one at the foot of the table the *red spot*. The centre spot is used only when a ball forced off the table finds both white and red spots occupied. Therefore, should the white ball forced off the table have its spot occupied, it would be placed on the red spot, or on the white spot if it be the red ball that is forced off the table.

In beginning the game the red ball and one white are placed on their respective spots, the other white remaining in hand, and is placed near the white spot previous to the opening stroke in the game. The player can take any position within six inches of the white spot on a line parallel or nearly parallel with the head cushion, but he must strike the red ball first before a count can be effected.

Rules for the Three-ball French Game.—1. The game is begun by stringing for the lead; the player who brings his ball nearest to the cushion at the head of the table winning the choice of balls and the right to play first, as in the American game. Should the player fail to count, his opponent then makes the next play, aiming at will at either ball on the table.

2. A carom consists in hitting both object-balls with the cue-ball in a fair and unobjectionable way; each will count *one* for the player. A penalty of *one* shall also be counted against the player for every miss occurring during the game, though this is by agreement usually, dispensed with.

3. A ball forced off the table is put back on its proper

BILLIARDS.

spot. Should the player's ball jump off the table after counting, the count is good, the ball is spotted, and the player plays from the spot.

4. If in playing a shot the cue be not withdrawn from the cue-ball before the cue-ball comes in contact with the object-ball, the shot is foul, the player loses his count, and his hand is out.

5. If the balls be disturbed accidentally through the medium of any agency other than the player himself, they must be replaced and the player allowed to proceed.

6. If in the act of playing the player disturb any ball other than his own, he cannot make a counting stroke, but he may play for safety. Should he disturb a ball after having played successfully, he loses his count on that shot; his hand is out, and the ball so disturbed is placed back as near as possible in the position which it formerly occupied on the table, the other balls remaining where they stop.

7. Should a player touch his own ball with the cue or otherwise previous to playing, it is foul, the player loses one, and cannot play for safety. It sometimes happens that the player after having touched his ball gives a second stroke; then the balls remain where they stop, or are replaced as near as possible in their former position at the option of his opponent.

8. When the cue-ball is very near another, the player shall not play without warning his adversary that they do not touch, and giving him sufficient time to satisfy himself on that point.

9. When the cue-ball is in contact with another, the balls are spotted, and the player plays with his ball in hand.

10. Playing with the wrong ball is foul. However, should the player using the wrong ball play more than one shot with it, he shall be entitled to his score just the same as if he had played with his own; as soon as his hand is out the white balls must change places, and the game proceed as usual.

11. In all match-games for a stake, the crotch is debarred. The object-balls shall be considered crotched whenever the centres of both lie within a $4\frac{1}{2}$ -inch square at either corner of the table. When the object-balls are so within said square, three counts only will be allowed, except one of the object-balls or both be forced out of it. In case of failure by the player, his hand is out, and the next player goes on to play with the balls in position as left by the last player.

12. In this game no player is allowed to withdraw before the game is out; by so doing he forfeits the game. The decision of the referee is final, but it might happen, under extraordinary circumstances, that one of the players should believe his rights to have been violated by the referee. In such a case he must declare the subject of his grievance, and announce that he is playing the game under protest. Then, should he lose the game, the subject of the grievance is left to the decision of experts mutually agreed upon.

Another common game played upon a billiard-table is

BILLIARDS.

called Pool. It is quite different from the regular game, nor is it certain that a good player at one should greatly distinguish himself at the other. Pool is much played at public billiard-rooms, and though inferior to the regular game, and with some undesirable associations, is found interesting by many, and requires, for a first-rate player, steadiness of hand and eye, imperturbable temper, and exact dynamical calculation. Pool is played by any number of persons—when between two only, it is called ‘single pool,’ and is nothing else than the old game at B. before the introduction of the red ball—and after various methods, such as playing at the last player, playing at the nearest ball, and playing at any ball whatever—the last being perhaps the most common.

Rules for Pool.—A number of small balls, each numbered from one upwards, according to the number of players, are placed in a pocket and drawn thence by the marker and distributed to the players. No. 1 leads the red ball, No. 2 plays at No. 1, No. 3 at No. 2—the striker always to play with the ball last played at, except where a hazard is made; then the next player leads with the red ball, and he whose run is next in order plays from the string.

1. In pool the red ball must first be played, and in leading it Rule 2 must be strictly enjoined, with this exception—if the first lead be not liked by the player he may always have the privilege of spotting his ball.

2. If the leader follow his ball with either mace or cue beyond the middle pocket, it is no lead; and if his adversary, or the person next to play, chooses he may make him lead again, or cause the ball to be placed upon the pool spot at his option.

3. If a player, in the act of striking, be baffled or impeded in his stroke by his opponent or a spectator he has a right to recommence his stroke.

4. If the striker, while in the act of playing, should accidentally touch or move his own ball, without intending at the time to make a stroke, he loses no point; but the opponent may put the ball back in the place where it stood; and if he hole the ball, after it has been replaced, it is good, and the ball so holed shall be marked.

5. Whoever stops or touches a ball when running, either with the instrument with which he plays, or otherwise, it is deemed a foul shot, and the person so touching the balls before they have done running loses a mark. This rule must always be enforced.

6. If a ball is made to go extremely near the brink of a pocket, and, after sensibly standing still for a longer or shorter time, should fall into it, the striker wins nothing, and the ball must be put on the same brink where it stood before the adversary makes his next stroke; and if it should fall into the pocket at the instant the striker has played upon his ball, so as to prevent the success of his stroke, the balls must be replaced in the same position, or as near as possible, and the striker must play again.

7. If any person call upon another to play out of his

BILLIARDS.

turn, the person so calling shall take the mark and not he who plays, and the next in turn must lead.

8. If any person play out of his turn, unless called upon, he must be marked, unless he hole the ball played at in which case the ball so holed shall be marked, and the next in turn to the person who ought to have played must lead.

9. Any person whose ball is alive may take a hazard, and if he miss holing the ball he must be marked.

10. The person whose turn it is to play has the first right to take a hazard, and he must be marked if he do not hole the ball, provided any person in the pool previously offers to take such hazard.

11. There can be but one privilege and that must be taken by the first person killed, unless by consent of all the players that it may remain open, and the person first killed must decide at once whether he will take it and play in turn.

12. No person can take a ball if, having been in the room when the balls were drawn, he neglects to do so in turn, unless said person obtain the consent of all who are playing; and no person in any case can take a ball after the privilege is gone.

13. No person in the pool can have an interest in any other ball than the one which number he draws; nor can that person buy any other ball, or own an interest in any other, so long as his original ball is alive; but when his original number is dead he may buy that of any other who may choose to sell, but cannot permit any other person to play it who may have an interest with him, but he must play it out unless he sell his whole interest, in which case the person buying, if originally in the pool, shall finish playing out the number. No person, not originally in the pool, can buy in.

14. If a person sell his ball upon the lead the purchaser must abide by the lead, or may spot the same as he pleases.

15. If a person make a lead he cannot change the same even if the person next to play sell his ball to a third person after the lead has been made, but he may have the liberty of spotting it.

16. No person can strike twice in succession; and if two are left in the pool, and A strikes at the ball and hole himself, B must lead; but should A hole B's ball then A must lead.

17. Where there are but two left in the pool, and one of them wishes to divide or sell, the adversary shall always have the privilege of buying, and if he refuse to give as much as another offers then his adversary has full right to sell to any one who has been in the the pool.

18. If a person playing upon the lead place his ball out of the string, and is challenged by the previous player, while in the act of striking, the balls must be placed as before and the stroke made over.

Pin Pool (as played in New York).—This game is played by two or more persons in the following manner: There are five small wooden pins set up in the centre of the table, in diamond form; the one at the apex next the head

BILLIARDS.

of the table is No. 1, the one to the right is No. 2, the one to the left is No. 3, the one next the foot of the table is No. 4, and the one in the centre is No. 5; and they are placed about $2\frac{1}{3}$ inches apart from one another.

The usual way of designating them is by marking the numbers on the cloth next to the spot which each pin occupies, and the rotation of the players is determined by the small numbered balls, as in Two-ball Pool.

After this is determined each player has another small ball, with a number on it, dealt to him by the game-keeper, and this is termed his private ball.

The red ball is then placed on its appropriate spot, about five inches from the lower cushion midway between the two corner pockets, and he who has ball No. 1 plays from the string; No. 2 then plays from the string with the other white ball; No. 3 succeeds No. 2, and can play with, or at, any ball on the table.

There are only three balls used in this game, one red and two white balls. The object of the players is to knock down as many pins as will count thirty-one, by adding the pins so knocked down and the number on the private ball together, and he who makes thirty-one wins the pool.

For example: If the number on the private ball be ten it will then be necessary for the player to make the number count twenty-one by the pins.

Rules for Pin Pool.—1. He who draws No. 1 must play with one of the white balls at the red ball, or place it on the spot used as the deep-red spot in the game of billiards. He who draws No. 2 must then play with the other white ball, or, if he so choose, can place it on the spot used as the light-red spot.

2. No. 1 and No. 2 have the privilege of playing from any part of the string; No. 2 can play on any ball outside of the string; and should all the balls happen to be within the string he may have the red ball placed on its appropriate spot for the purpose of playing on it.

3. The player must first strike a ball with his own ball before he knocks down the pins, or otherwise it is no count.

4. If a player first touch a pin with his own ball, and then strike another ball, and that or his own ball should get pins thereby, he is not entitled to count.

5. After the second stroke is made in the game the striker has a right to play with or at any ball on the table.

6. Missing or pocketing one's ball or another, or jumping one's own, or another ball, off the table, goes for nought—knocking the pins down alone counts.

7. If a ball be holed, or off the table, it must be placed on the spot used for spotting the red ball at the first stroke, and if that spot be occupied it is then placed on the deep-red spot; and if that also be occupied it is then to be placed on the light-red spot. If the player make a miss, his ball is to be spotted in the same manner.

8. If the striker knock down the four outside pins, and leave the centre one (No. 5) standing, he wins the pool.

9. Sufficient time must be allowed after the stroke is

BILLIARDS.

made to give the player an opportunity of adding up his game, and to proclaim pool, if he have made it, before the next play, and if he neglects to claim it before such play he must wait until his own turn to play comes again. And if another make pool in the mean time, that other is entitled to it, and not he who failed to claim it.

10. If a ball rest so as to occupy any of the spots intended for the pins, such pins are to remain off the table until those spots so occupied become vacant.

11. If a ball roll against a pin, and cause it to lean over, or knock it off the spot without such pin falling, the striker cannot claim such pin, as nothing counts but knocking the pins down. But when the pins are knocked two inches from the spot they are considered down, whether they be up or down.

12. If a player play out of his turn he cannot avail himself of any count he may have made by such stroke, and if he get pins enough to 'burst' him it is his own loss, provided he was not called on to play; in such case he cannot suffer by it, and any count effected by such stroke goes for nought. He, whose turn it was to play, when the other was called, or played out of his turn, plays next in order.

13. If the striker knock down more pins than would by adding such pins to the number on his private ball count more than thirty-one, he is 'burst,' i.e. 'dead;' and if he then wish to take a privilege he must decide before the next stroke be made, otherwise he cannot take it without consent of all the players.

14. In taking a privilege the player has the right to draw a new private ball, and then of choosing between that and his original ball; but he must decide quickly which ball he will keep, before the next stroke is made.

15. New privileges can be taken by players that are 'burst,' as often as there are bursts in the game.

16. Each privilege follows the last number in rotation. For instance, if there are six playing, and one be 'burst,' he succeeds No. 6 and becomes No. 7; if another become 'burst' he succeeds as No. 8; and if it be the highest number that is 'burst' he plays on immediately after choosing his private ball.

17. *If the balls touch*, or be in contact with one another, the striker has the right to play with either of the balls so touching straight at the pins without striking another ball, and any pins he may knock down count good, except in such cases as do not conflict with Rule 19.

18. Any pin knocked down by jarring the table, blowing upon the ball, or altering or intercepting its course in running does not count, nor is the player entitled to any pin or pins that may be made by any other ball, though not interfered with during the same play.

19. Should a ball jump off the table and come in contact with a player, or any other person, and fall back on the table and knock down pins, such pin or pins so knocked down shall not count, and the ball must be spotted; but if another ball get pins by the same stroke the pins so made by that other ball are good.

BILL IN CHANCERY.

20. If a player make pool, and he should at that time have more than one private ball in his possession, he is not entitled to the pool, but he is considered 'burst.'

21. The player in this game, as in billiards, has the sole right of looking after his own interests, and neither the game-keeper nor any of the bystanders has any right to dictate to, or advise him, unless by consent of all the players.

22. It is the duty of the game-keeper to make up the pool, to deal out the small balls to the players, to see that the balls and pins are properly spotted, and that there are no more private balls out than there are players in the pool, and if any such balls are missing, to proclaim its number to the players, as the pool cannot be won by such ball; to call out to players each number in its turn; to proclaim, loud enough for them to hear it, the number they may already count from pins knocked down, and to have all pins properly knocked down placed to the credit of the respective players who may have made the stroke.

The best billiard-tables, furnished with slate bed and india-rubber cushions, cost from \$400 upwards.

BILL, or BILL OF COMPLAINT, IN CHANCERY: a formal statement in writing or pleading, by a plaintiff in the court of chancery, asking its equitable redress or relief. See **CHANCERY: PLEADING: SUMMONS.**

When drawn up in complete and solemn form, the B. in C. contains 9 parts, of which several may now be omitted at discretion of the plaintiff. These parts are: 1, the *address*, to the chancellor, the court, or judge acting as chancellor; 2, the *names* of plaintiffs and defendants, and their descriptions; 3, the *statement* of the plaintiff's case, alleging every material fact in favor of the plaintiff of which the evidence is to be offered in court; 4, a *general charge of confederacy*, avowing a confederacy between defendants to the injury of plaintiff; 5, *allegations* of the defendant's pretenses; 6, the *clause of jurisdiction*, alleging that the plaintiff is without remedy at law; 7, *prayer* that defendant be required to answer plaintiff's interrogatories; 8, *prayer for relief*; 9, *prayer for process*. The Rules of Practice of the equity courts of the United States dispense with parts 4, 5, and 6. In all cases the B. in C. must be signed by counsel, and the facts supported by affidavit.

BILL IN CRIMINAL CASES—BILLINGS.

BILL IN CRIMINAL CASES: an indictment for a crime or misdemeanor, when preferred before a grand jury. If that body find 'a true bill,' the prisoner or party accused is thereupon tried before a petty jury, whose verdict determines his guilt or his innocence; but if the grand jury 'ignore the bill,' the accused is at once set at liberty. In the latter event, however, other bills may be sent up against him, with or without the same result. See **ARRAIGNMENT: GRAND JURY: INDICTMENT: PROSECUTION: TRIAL.**

BILLINGS, bil'lingz, HAMMATT: architect: b. Mass.; d. 1874, Nov. 14. He made his home in Boston, and gained high repute by his work in decorative design and book illustration, besides general architecture. He made the design for the Pilgrims' monument at Plymouth, also for the case of the great organ in the Boston music-hall. Besides illustrations for books, he designed ornamental book-covers with marked success. Among a number of pleasing drawings by him, one in sepia, the *Enchanted Monk*, was greatly admired.

BIL'LINGS, JOHN SHAW, M.D., LL.D.: surgeon: 1838, Apr. 12———; b. Switzerland co. Ind. He graduated 1857 at Miami Univ., and 1860 at the Ohio Med. Coll. He was appointed act. asst. surgeon U. S. A., 1861, Nov., was in charge of the milit. hospitals at Washington and West Philadelphia two years, had some field service, and then did general hospital duty until 1864, Dec., when he became connected with the surgeon-gen's. office in Washington. In 1876, Dec., he was appointed surgeon in the regular army, with the rank of major. B. is a member of leading scientific socs. in America and Europe, and was vice-pres. of the National Board of Health 1879-80. He was promoted lieutenant-colonel and deputy surgeon-general 1894, June 6, and was retired 1895, Oct. 1. He was Prof. of Hygiene in the Univ. of Pennsylvania in 1893-96; and in the last year became director of the New York Public Library (Astor, Lenox, and Tilden foundations). His publications include *National Medical Dictionary, Ventilation and Heating*, etc.

BIL'LINGS, JOSH: see **SHAW, HENRY WHEELER.**

BIL'LINGS, WILLIAM: musical composer: 1746, Oct. 7—1800, Sep. 26; b. Boston, Mass. Brought up to the trade of a tanner, he made good use of his intellectual powers, and was for a time a teacher. He was the pioneer in America among musical composers, and did much to afford a higher education in singing, introducing into his work passages which made a demand for a better standard of musical ability, especially in singing devotional music, than was then in vogue. During the revolutionary war, B. composed a number of patriotic pieces with words which were sung in the camps of the colonial army. Among these were, *Lamentation over Boston, Retrospect, Independence, Columbia*, all of which became well known and popular. B. published 1770, *The New England Psalm-Singer, or American Chorister, Containing a Number of Psalm-Tunes, Anthems, and Canons*, reproduced 1778 in condensed form,

BILLINGSGATE—BILLION.

which became very popular. In 1779 he published a work entitled *Music in Miniature*, which, besides a number of old tunes, contained 31 new and original compositions. He published *The Psalm-Singer's Amusement*, a work which also found wide acceptance; *The Suffolk Harmony* (1786); *The Continental Harmony* (1794); and a large number of anthems and other devotional pieces. B.'s work, though far below the modern standard, gave the first positive advance to the church-music of this country. He died in Boston.

BILLINGSGATE, n. *bil' lîngz-găt* [the great fish-market in London]: rough or foul language, such as is spoken at Billingsgate. B. is the name of a gate, wharf, and fish market, a little below London Bridge, to the w. of the custom-house; opened 1558 as a landing-place for provisions; and, 1699 made 'a free and open market for all sorts of fish.' The present building was finished 1874. The unpolished phraseology native, though not peculiar, to this quarter of London, is proverbial.

BILLINGTON, *bil' lîng-ton*, **ELIZABETH**: 1769–1818, Aug. 25; b. London; dau. of a German musician named Weichsel: she was the most celebrated English female singer of her day. She early came forward as a performer on the piano and as a composer; and having married her music-master, Thomas B., appeared with brilliant success on the opera stage in Dublin, 1786. Returning to London, she was engaged at Covent Garden at the then unheard-of salary of £1,000 for the season. She perfected her musical education under Sacchini in Paris, who wrote for her his opera, *Inez de Castro*, while she was singing in Naples, 1794. She appeared subsequently in Venice and Rome with the greatest applause. In 1799, her first husband being dead, not without suspicion of poison, she married a young Frenchman, M. Felissent, but returned to London, 1801, where she received £3,150 for six months, playing alternately at Covent Garden and Drury Lane. She retired from the stage, 1811, and died seven years later at her villa, near Venice. Her character as a wife was the reverse of exemplary; but as a singer she was unrivalled. To a voice of the largest compass and richest tone, trained in all the art of the Italian school, she added a fascinating personal beauty and grace. In illustration of her spirit, it is told that Catharine II. proposing, through her London ambassador, to engage Mrs. B. for the theatre of St. Petersburg, the vocalist demanded a sum that seemed exorbitant to the ambassador, who said, 'The Empress of all the Russias does not give more to her ministers.' 'Then let her make her ministers sing,' was the reply.

BILL IN PARLIAMENT: in the United Kingdom, a proposed law or act: see **PARLIAMENT**.

BILLION, n. *bîl' yŭn* [*F. billion*—from *L. bis*, twice; and *million*]: in *Eng. notation*, a million of millions or 1,000,000,000,000; in *F. notation* (also in the *United States notation*), a thousand millions or 1,000,000,000.

BILLITON—BILL OF ATTAINDER.

BILLITON, *bil'li-ton'*: island in the Dutch East Indies, between the s.e. of Banca and the s.w. of Borneo. It is separated from the former by Clement's Strait, and from the latter by the Caremata or B. Passage. Its n.w. point is in lat. 3° 13' s., long. 108 7' e. Estimated area, 1,855 sq. m. It is rich in tin, iron, and timber, and exports trepang, edible birds' nests, sea weed, tortoise-shell, and wax. Its coasts are beset with rocks and islets. Pop. (1882) 32,210; (1890) 38,779; (1900) 43,386.

BILL OF ADVENTURE: a writing by a merchant, stating that goods shipped by him, and in his name, are the property of another, whose *adventure* or chance the transaction is—the shipping merchant, on the other hand, undertaking to account to the adventurer for the produce. Generally, in commercial law, an adventure may be said to be a speculation in goods shipped under the care of a *supercargo*, to be disposed of by him to the best advantage, for the benefit of his employers.

BILL OF ATTAINDER; and **BILL OF PAINS AND PENALTIES**: bills in the British parliament, introduced for penally enacting the attaint and punishment of persons who have criminally offended against the state and public peace. Such a legislative proceeding was had recourse to generally in times of turbulence, when, either from the peculiar nature of the offense, or in consequence of difficulties in the application of the ordinary laws, it became necessary to resort to parliament. Frequently during the reign of Henry VIII., persons of the highest rank were brought to the scaffold by such means; among whom were the Earl of Surrey, the Earl of Essex, and others, who suffered for denying the king's supremacy; and during other reigns, both before and since, these bills were more or less had recourse to. There were greater facilities for conviction by this penal legislation than by the ordinary judicial procedure at law; because, while in the latter the strict rules of legal evidence must have been observed, the inquiry under a bill of attainder, or of pains and penalties, was entirely in the hands of parliament, who might dispense at their pleasure with such rules and forms of law as appeared inconvenient or unsuitable to the purpose in hand. Accordingly, in most of the cases to which we have referred, the bills were passed upon evidence which could never have been received as sufficient, or even admissible, in a court of law; and there are even instances where parties were attainted, and punished, without there being any evidence against them at all, and even without their being heard in defense. Under the Stuarts, this extraordinary mode of proceeding in parliament was seldom had recourse to in England, and it has been still less frequent since the accession of the House of Hanover. The Jacobite movement in Scotland, after the union with that country, was productive of several instances of parliamentary attainder, which, however, resulted merely in the forfeiture of the estates of the attainted parties, and these attainders were likewise unattended with the harsh and, in

BILL OF COSTS—BILL OF CREDIT.

too many instances, capital consequences, formerly the inevitable results of treason so discovered. In regard to bills of pains and penalties, perhaps the two most remarkable instances are those of Bishop Atterbury, 1722 (see *ATTERBURY*), and of Queen Caroline, wife of George IV., 1820.

The proceedings of parliament in passing bills of attainder, and of pains and penalties, do not vary from those adopted in regard to other bills. But the parties who are subjected to these proceedings are admitted to defend themselves by counsel and witnesses before both houses. In the best of times, this summary power of parliament to punish criminals by statute should be regarded with jealousy; but whenever a fitting occasion arises for its exercise, it is undoubtedly the highest form of parliamentary judicature. In impeachments, the commons are but accusers and advocates; while the lords alone are judges of the crime. On the other hand, in passing bills of attainder, the commons commit themselves by no accusation, nor are their powers directed against the offender; but they are judges of equal jurisdiction, and with the same responsibilities, as the lords; and the accused can be condemned only by the unanimous judgment of the crown, the lords, and the commons.—May's *Proceedings of Parliament*, 3d ed., p. 509. In passing bills of attainder, the bishops, contrary to the practice in capital impeachments, take part in the proceedings, and vote.

In such parliamentary attainders the bill sets out, by way of preamble, the facts and evidence on which it is founded, and concludes, by way of enactment, that the accused 'is hereby convicted and attainted of high treason, and shall suffer the pains of death, and incur all forfeitures as a person attainted of high treason.' In the case of pains and penalties the preamble generally assumes the facts as proved, and proceeds to enact the pains and penalties; that is, the deprivations, indignities, and other punishment awarded. See *PAINS AND PENALTIES: PARLIAMENT (BILL IN)*.

Attainder is unknown in the United States, all bills to that effect, or other laws *ex post facto*, being forbidden by the constitution, art. 1, section 9.

BILL OF COSTS: in practice, a statement of the items which form the total amount of the cost of a suit or action. It must be taxed by the proper officer of the court, and is demandable, as a matter of right, before payment of the costs. See *COSTS*.

BILL OF CREDIT: paper issued by the authority of a state on the faith of the state, and designed to circulate as money; promissory notes, or bills issued by a state government exclusively on the credit of the state and intended to circulate through the state as money, redeemable at a future day, and for the payment of which the faith of the state is pledged. By the constitution of the United States no state is permitted to emit bills of credit or make anything but gold and silver coin a tender in payment of

BILL OF DEBT—BILL OF EXCEPTIONS.

debts; but this prohibition does not apply to bills issued by banks owned by the state or having a specific capital set apart, nor does it apply to notes issued by corporations or individuals which are not made legal tender.

BILL OF DEBT: an old term applied to promissory notes and bonds for the payment of money.

BILL OF DISCOVERY, in Law: bill praying for the discovery of facts within the knowledge of the person against whom the bill is brought, or asking for deeds, writings, etc., in his charge. The characteristic feature of the B. is that it does not seek for relief in consequence of the discovery, though asking for a stay of proceedings till the discovery be made. It is generally used in aid of the jurisdiction of a law court, to enable the prosecutor or defendant in a suit to obtain a discovery of facts that are material for his case. The party must be entitled to the discovery he is seeking, and can have a discovery only of what is necessary for his own title, and must not impertinently inspect or examine that of the adversary. It has been a matter of controversy whether the defendant is entitled to discovery to assist him in the preparation of his answer. The B. must exhibit the existence of a vested title and interest in the plaintiff, and wherein such title and interest lie. This bill cannot be brought in aid of a mandamus, a criminal prosecution, or a suit for penalty.

BILL OF EXCEPTIONS: a written statement of objections to the decision of the court upon a point of law made by a party to the cause and formally certified by the judge or court who made the decision. In the trial of civil causes, when the court, in making a decision, is believed by the counsel against whom the decision is made to have mistaken the law, such counsel may tender exceptions to the ruling and demand that the judge shall authenticate the bill. In criminal causes at common law judges are not required to authenticate exceptions. The bill must be taken out at the time the decision is made, and any objection must be taken before the jury have delivered their verdict. In practice, however, the point is merely noted at the time and the bill is afterwards settled. An exception cannot be taken to the decision of the court upon matters resting in its discretion. All objections not appearing in a bill are excluded. See **TRIAL**.

BILL OF EXCHANGE.

BILL OF EXCHANGE: a document purporting to be an instrument of pecuniary obligation for value received, and which is employed for the purpose of settling a debt in a manner convenient to the parties concerned. The original and simple idea of a bill is this: Two parties residing at a distance from each other can settle their transactions without the trouble or risk of sending money direct from the debtor to the creditor. Thus, A and B are two parties in business in New York, and C and D are merchants in Cadiz. A owes C \$1,000; and D owes B a like sum. Instead of A sending cash to C, and D to B, A pays B and receives B's bill on D, which he sends to C, who receives the amount from D; so that the transaction throughout is settled, without a farthing in money being sent from Cadiz to New York, or from New York to Cadiz. Another simple idea of a bill is this: One person owes another \$100 for goods, for which he is to have credit for three months. The creditor, however, not being able conveniently to be without the money for that length of time, gets from the debtor an obligation or bill bearing that the \$100 is to be paid in three months. This bill, being a negotiable instrument, will be discounted by a banker, or other capitalist, who now stands in the position of the creditor, and receives payment when the bill is due. Thus, a bill of exchange performs two kinds of offices in commerce—it saves the transmission of coined money, and it enables creditors not only to fix debtors to a day of payment, but to get the use of a sum equivalent to the debt (less a small discount) before it is properly due.

The origin of this important mercantile instrument is attributed by Montesquieu and others to the Jews and Lombards, when banished from France and England in the 13th c., for their usury and other alleged vices. It is certain that hitherto no trace of such bills has been discovered either in the Roman code, or in any other system of ancient jurisprudence. The first notice of them in modern times occurs about the middle of the 12th c., and by the end of the 14th they were in general use in all the commercial states of Europe. In England, from about the middle of the 14th c. down to the time of James I., and for many years afterwards, bills of exchange were restricted to the purposes of foreign commerce. What are called inland bills—that is, bills drawn by and upon persons resident in the same country or state—were not employed much earlier than the reign of Charles II., and even then they were regarded with distrust and jealousy by the English judges. Another restriction upon bills of exchange was, that the privilege of their use was confined to merchants. But all restraints on such instruments gradually yielded to the wants and conveniences of society, and now any one capable of making a contract can be a party to a bill transaction, without regard to position, calling, or occupation. A bill of exchange may contain words prohibiting transfer, and be valid only between the two original parties. The drawer or indorser has it in his power to give the name of a referee or party to whom the

BILL OF EXCHANGE.

holder may resort, in case it may be dishonored. Presentment is excused where the drawee is dead, or a bankrupt, or a fictitious or incapacitated person.

A bill of exchange, as distinguished from a *promissory note* (q.v.), is defined in law-books to be a written and open letter of request, addressed by a person who is called the drawer, to another person called the drawee, desiring him to pay a certain sum of money, either to the drawer himself, or to a third party called the payee, within a certain time after its date, or after it is presented for payment, or on demand. If the drawee signs the bill in token of his agreeing to this request, he is called the *acceptor*. For the constitution of the bill itself, no particular form of words is necessary, provided its characteristic qualities clearly appear on the face of it, as an essentially pecuniary instrument; a bill of exchange is good only for a certain sum in money: such an instrument for the delivery of *goods* or property other than money, would be invalid. But although no particular words are required in a bill or note, it is advisable usually to adhere, as much as possible, to their customary form.

In regard to foreign bills, the risk of miscarriage to which they are liable in their transmission to distant countries has given rise to the custom of drawing them *in sets*; that is, writing out two or three of the same form and tenor, and transmitting them to the payee by different channels, so that if one or two of the individuals of any set are lost, the other might reach its destination. The first of the set that is presented and accepted is alone entitled to payment, and payment of it discharges the acceptor; but foreign bills, of course, may also be drawn singly.

The following are the usual forms of the bills of exchange:

SIXTY-DAY BILL OF EXCHANGE.

Office of Brenton & Co.

£100.0.0. 1059 Wall St., New York, Dec. 16, 1887.

Sixty days after sight of this, our *First* of Exchange (second and third of the same tenor and date unpaid), pay to the order of *Andrew Scrivener, One hundred pounds*, for value received, and charge account of

BRENTON & Co.

To Messrs. Brenton & Stanfield,
Flanders Court, Longbury, London.

Office of Brenton & Co.

£100.0.0. 1059 Wall St., New York, Dec. 16, 1887.

Sixty days after sight of this, our *Second* of Exchange (first and third of the same tenor and date unpaid), pay to the order of *Andrew Scrivener, One hundred pounds*, for value received, and charge account of

BRENTON & Co.

To Messrs. Brenton & Stanfield,
Flanders Court, Longbury, London.

Office of Brenton & Co.

£100.0.0. 1059 Wall St., New York, Dec. 16, 1887.

Sixty days after sight of this, our *Third* of Exchange

BILL OF EXCHANGE.

(first and second of the same tenor and date unpaid), pay to the order of *Andrew Scrivener, One hundred pounds*, for value received, and charge account of

BRENTON & Co.

To Messrs. Brenton & Stanfield,
Flanders Court, Longbury, London.

If 'Mr. Scrivener' of New York, desired to pay some one in London a sum of £100 he would purchase a bill of exchange in three forms, as above. He could send the 'first' immediately (indorsing it over to his correspondent) and the 'second' by the next steamer, to provide for the possible miscarrying of the 'first,' and hold the 'third' until he had heard from the 'first.' If he bought it on the date of the bill, he will have paid for it \$482, the quotation for that day being '\$4.82 for 60 day bills, and \$4.85 for demand.' In such quotations the price of a pound sterling is given in dollars and cents. In quotations of exchange in France or other countries where the franc is the money unit, this method is reversed, and the price of a dollar in francs is given. Thus, on the day mentioned, the price of exchange in francs was '5.24½ for long and 5.21½ for short bills.'

The bill being received by the correspondent, it is presented to the party on whom it is drawn, for 'acceptance,' which is the act by which the drawee recognizes, or accepts the bill as a just demand, and evinces his intention to pay it when due, by writing his name across the bill, with the word 'accepted' before it. Of course all proper precautions are taken by the drawee before accepting the bill, to provide against fraud, by examining the signature and seeing that the sum has not been 'raised' from a smaller to a greater amount. If a drawee accept a forged bill, or a bill for a larger amount than that originally named by the drawer, he is liable to pay a *bona fide* holder; nor has he any right to recover from the drawer the difference. There is, however, conditional acceptance, by which the drawee accepts only in such a form as will subject him to payment of the bill on a certain specified contingency. The bill, when accepted, is negotiable, on being transferred by indorsement, the indorsee taking it for its full value at maturity, and either cashing or discounting it for the holder. There may be a succession of such transfers, the last indorsee being entitled to payment. And the bill, on coming to maturity, may be renewed by agreement between the holder and the drawee. If this be not done, and the bill is not paid, the holder has recourse to the law through *protest*, which provides a summary proceeding against the drawee for immediate payment, or his declaration of insolvency. See INDORSEMENT· PROMISSORY NOTE: RENEWAL: LIMITATION.

In the United States there has sprung up a method of dealing with bills of exchange which is not much known in England. This consists in selling bills without a concurrent obligation by indorsement to make them good. Instead of discounting his bills in the usual form through a banker, a merchant in New York will sell his bills to a

BILL OF HEALTH—BILL OF LADING.

broker or dealer in this kind of instrument, the price paid being according to the state of the money-market and the creditworthiness of the acceptor. In such cases, the purchaser stands in the place of the drawer, undertakes all risks, and as custodian of the bill, has the power of legally exacting payment. This method of transacting with bills is called discounting *without recourse*.

ACCOMMODATION BILL. A bill in its legitimate sense is a document constituting a debt, and as such is beneficial to all parties connected with its negotiation. A owes B \$500. A cannot conveniently pay the amount, while B is in need of it; B draws on A, and C (a banker) discounts, i.e., for a consideration pays the amount to B. B thus gets his money at once, A obtains time, while C makes a profit for advancing. These facilities have had the effect of inducing bills to be resorted to for raising money where no value is given, and in which one party gives the use of his name for the *accommodation* of another. In the above case, for example, let us suppose that A does not owe B, but yet accepts B's draft. If C discounts the bill, it is immaterial whether he knows that A has got value or not—as an onerous holder, he can compel payment from A if B cannot pay the bill. But if merely in B's hands the amount is not recoverable from A if the latter can prove that no value was received by him. Accommodation bills give rise to much fraud and rash speculation, and many attempts have been made to suppress the system; but it is difficult to do so without unduly interfering with the negotiation of *bona-fide* bills.

BILL OF HEALTH: certificate or instrument, signed by consuls or other proper authorities, delivered to the masters of ships at the time of their clearing out from all ports or places suspected of being particularly subject to infectious disorders, certifying the state of health at the time that such ship sailed. A *clean* bill imports that at the time the ship sailed no infectious disorder was known to exist. A *suspected* bill, commonly called a *touched* patent or bill, imports that there were rumors of an infectious disorder, but it had not actually appeared. A *foul* bill, or the absence of a clean bill, imports that the place was infected when the vessel sailed. See McCulloch's *Commercial Dictionary*.

BILL OF INDEMNITY: see INDEMNITY, ACT OF: ABJURATION.

BILL OF INDICTMENT: a written accusation of one or more persons of a crime or misdemeanor lawfully presented to a grand jury. If twelve or more members of the jury shall be satisfied that on the given charge the accused ought to be tried, the return is made 'a true bill;' but if no sufficient ground is shown for placing the accused on trial a return is made 'not a true bill,' or 'not found.'

BILL OF LADING: primarily, a receipt from a captain of a vessel to the shipper (usually termed the *consignor*), undertaking to deliver the goods—on payment of freight—to some person whose name is therein expressed, or indorsed thereon by the consignor; and the delivery of this instrument—in-

BILL OF PARTICULARS—BILL OM.

depe. dently of the actual delivery of the goods—will suffice to pass and transfer to the party so named (usually termed the *consignee*), or to any other person whose name he may think fit to indorse thereon, the property in such goods. This form of contract is now applicable to all forms of transportation of goods, by land or water; and a memorandum given by a common carrier may suffice as a bill of lading. See STOPPAGE IN TRANSITU.

BILL OF PARTICULARS: in practice, a detailed uniform statement of a complainant's cause of action or of the defendant's set-off. It is an account of the items of the claim, and shows the manner in which they arose. The statutory provisions with regard to this vary widely in the different states, but generally require the complainant to file a bill of particulars either in connection with his declaration, or subsequent to it upon request of the other party to the suit, upon an order of the court in some cases, in others without such order. The bill of particulars need not specify particulars of matters not in litigation nor of payments admitted. When filed the bill concludes the complaint. In pleading set off, or giving notice, the defense must give a bill of particulars, failing to do which it will be precluded from giving any evidence in support of the set-off or notice at the trial. The bill of particulars must be as full and specific as the nature of the case admits, in respect to all matters as to which the adverse party ought to have information.

BILL OF RIGHTS: see RIGHTS, DECLARATION OF.

BILL OF SALE: a writing under seal, evidencing a grant or assignment of chattels personal. The occasions to which these instruments are commonly made applicable are sales of fixtures and furniture in a house, of the stock of a shop, of the good-will of a business, of an office, or the like. But their most important use is in the transfer of property in ships, which being held in shares, cannot, in general, be delivered over on each change of part-ownership. Such bill of sale may be either absolute or conditional; in the former case operating as a conveyance, and in the latter as a security. Such a bill is not indispensable in relation to ordinary chattels, in which case a contract to sell, with the transfer may usually suffice.

BILL OF SIGHT: in Britain, under the customs laws, a bill of provisional entry of goods into a port—to be soon followed by the entire description of the goods for securing a perfect entry.

BILL OF STORE: a license granted under the Brit. Regulations by the custom-house to merchants to carry such store and provisions as are necessary for a voyage, custom-free. **BILL OF VICTUALLING,** document relating to the stores put on board a ship when leaving port; a safeguard in reference to customs duties.

BILLOM, *bêl-yōng'* or *bē-yōng'*: town of France, dept. Puy-de-Dôme, on a hill 14 m. e.s.e. of Clermont. It is one of the most ancient towns of Auvergne, and was form-

BILLON—BILSA.

erly surrounded by walls, which have now disappeared; its commerce and manufactures also have declined, though earthenware is manufactured. So early as 1455, a university was founded at B., which a century later passed into the hands of the Jesuits, and was governed by them until the suppression of their order. Pop. about 4,000.

BILLON, *bīl'lon* (see **BULLION**): an alloy of copper and silver, in which the copper predominates; often used, especially in Germany (till superseded by the imperial nickel coinage) for the smaller denominations of money. Thus the North German *Silber groschen*, in value more than an English penny, was of B., and was about the size of an English fourpenny silver-piece. B., besides affording facilities for counterfeits, is dirty and inelegant.

BILLOW, *n. bīl'lō* [Dan. *bølge*; Sw. *bolja*; Dut. *bolghe*, a wave of the sea: comp. Gael. *bol'gach*, swollen—from *bolg*, a belly]: a very large wave or surge of the sea: V. to swell or rise into large waves; to surge. **BIL'LOWING**, imp. **BIL'LOWED**, pp. *-lōd*. **BIL'LOWY**, *a. -lō-ī*, full of billows; swelling into great waves.

BILLS OF MORTALITY: accounts of the births and deaths within a certain district. In London, these bills were commenced 1592. during the plague; but they were not continued uninterruptedly until the occurrence of another plague 1603, from which period, up to the present time, they have been continued, usually from week to week. See Wharton's *Law Dictionary*, and Knight's *London*.

BILMA, *bīl'mā*: town of the Sahara, central Africa: lat. 18° 40' n., long. 14° e., on an oasis called the Wady Kawas, on the route between Murzuk and Lake Tsad. It is the cap. of the Tibu country, and important as a resting-place of caravans crossing the desert.

BILOXI: a city in Harrison co., Miss., on Biloxi Bay and the Louisville and Nashville railroad; 80 miles n. e. of New Orleans. It is chiefly engaged in the canning of vegetables, fruit, fish, and oysters, but also has considerable shipping and manufacturing interests. In 1699 the first settlement by white men on the Mississippi was made here under Pierre Le Moyne d'Iberville. Biloxi is a popular summer and winter resort. Pop. (1900) 5,467.

BILSA, or **BHILSA**, *bīl'sā*: town of India, in Malwa, in the territory of Gwalior, Scindia's dominions, on the right bank of the Betwa, 188 m. s. from Gwalior, 32 m. n.e. from Bhopal. It is on an elevated mass of trap rock, and has a fort enclosed by a stone wall, and furnished with square towers and a ditch. Outside the walls are some spacious streets, and many good houses. B. was taken from the Hindus by Samsuddin Altamsh, sovereign of Delhi, 1230; and after several times changing hands between Hindu and Mussulman masters, was finally incorporated with the empire of Delhi by Akbar, 1570. B. and the pergunnah of which it is the capital are said to yield a revenue of 325,000 rupees. The finest tobacco produced in India is from a small piece of land, about three acres, near Bilsa. Its superiority is said to be entirely owing to careful cultivation,

BILSTON—BIMETALLISM.

There is at B. a brass cannon, of beautiful workmanship, said to have been made by order of Jehangir, $19\frac{1}{2}$ ft. in length, with a bore of 10 inches. Pop. (1891) 10,000.

BILSTON, *bils'ton*: town in s. Staffordshire, on rising-ground about 3 m. s.e. of Wolverhampton. It forms a part of the parliamentary borough of Wolverhampton. It has extensive iron and coal mines, iron smelting works, iron-foundries for making machinery, besides works for manufacturing tin-plate goods, japanned and enamelled wares, nails, wire, screws, and coarse pottery. It is the centre of the hardware trade, and consequently a very busy place. Fine sand, adapted for metal-casting, is found here. Pop. (1881) 22,730; (1891) 23,453.

BIMA, *bĕ'mā*: seaport in Sumbawa, one of the Sunda Isles; cap. of a state of the same name; lat. $8^{\circ} 30'$ s., long. 119° e. It is on a bay of the n. coast, being 100 m. to the e. of Sumbawa, a town feudally dependent on its sultan. Its chief exports are horses and timber.

BIMACULATE, *bī māk'ū-lāt*: having two spots.

BIMAH, *bĕ'mā*: river of India, a branch of the Kistnah (q.v.), rises in the table-land of the dist. of Poona, in the presidency of Bombay, 3,090 ft. above the level of the sea, and flowing s.e., falls into the Kistnah, in n. lat. $16^{\circ} 24'$, e. long. $77^{\circ} 20'$, after a course of more than 500 miles.

BIMANOUS, a. *bī-mā'nūs* [L. *bis*, twice; *manus*, the hand]: having two hands; two-handed. **BIMA'NA**, n. plu. *-mā'nā*, in some zoological systems, the first order of *Mammalia* (q.v.), an order containing the human species alone—the apes and monkeys being *quadrumanous* or four-handed: see **MAN**. Others reject this order altogether, protesting against this classification of man with brutes, and maintaining that the distance between him and them is too great to be represented as that between two orders in one class, or even between two classes of a zoological system. However, in assigning a place in this manner to man among animals, naturalists of course consider exclusively or chiefly his animal nature and bodily frame. The name B. has reference to the hands (q.v.) which terminate his anterior limbs; monkeys and lemurs, having opposable thumbs in all the four extremities, may be regarded as having four hands, although much less perfect than the human (see **QUADRUMANA**); but none of the inferior animals are *two-handed*, as man is.

BIMARGINATE, *bī-mār'jĭn-āt*: double bordered.

BIMEDIAL, a. *bī-mĕ'dĭ-al* [L. *bi*, two; *medius*, middle]: in *geom*, made up of the sum of two medial lines.

BIMEMBRAL, a. *bī-mĕm'bral* [L. *bis*, twice; *membra*, members]: having two members. (Said chiefly of sentences.)

BIMENSAL, a. *bī-mĕn'sāl* [L. *bis*, twice; *mensis*, a month]: occurring once in two months.

BIMETALISM: the use of a double metallic standard in currency with a fixed relative value for each of the two metals (gold and silver).

Money performs three functions: (1) it is a medium of

exchange to transfer value; (2) it is a standard of values; (3) it is used as a standard for debts long due.

The strongest argument in favor of B. is that it furnishes a more uniform standard for deferred debts—that third use of money above mentioned, which has hitherto been but inadequately met by every system of coinage that has yet been devised. But the opponents of B. claim that this can be better obtained by creating a legal unit or standard from the prices of an adequate number of staple articles, so that a long standing debt would at maturity be paid with the same purchasing-power which was in vogue when it was borrowed; and that such a multiple standard would take away all reason for B. The bimetallic system had its origin in France, and dates from the Revolution. Most countries have tried the system, and its opponents have attributed to it great hardships and losses to the people, caused by the never-ceasing fluctuations and alterations in its ever varying standard of value. See **BULLION: MONEY, ETC.**

Germany introduced a single gold standard by the statutes of 1871, Dec. 4, and 1873, July 9. England has had it since 1816. In both countries, token coins of other metals are legal tender for small amounts only. In the Latin Monetary Union, consisting of France, Italy, Belgium, and Switzerland, this composite system has actually prevailed since 1874, and the treaty of 1885 stipulates that the same shall continue at least five years after 1886, Jan. 1. Gold is the principal standard also in Portugal, Denmark, Norway, Sweden, and Holland. The United States established a double standard in 1792. The act of 1834 changed the legal rate from 1:15 to 1:16; and the weight of gold coin was diminished proportionally, and the standard of coinage thus debased. We had actually a gold currency, 1853 to 1861, Dec. 31, when specie payments were suspended. The law of 1873 practically demonetized silver. The law of 1878 restored its legal tender character.

The price of silver 1873-93 fluctuated greatly. Notwithstanding the purchases under the Bland-Allison act of 1878 and the 'Sherman' act of 1890 (the latter compelling the purchase of 54,000,000 ounces per year), the price declined to a point unprecedentedly low. This affected European trade with silver-using countries of the East, and confronted the United States with the problem of maintaining its silver at par. On the initiative of the United States a conference met at Brussels 1892, but failed of any practical results. The question was again agitated in the U. S. 1896 by the democratic party, which adopted a silver platform, with William Jennings Bryan as nominee for President. He, however, was defeated by WILLIAM MCKINLEY (*q. v.*), the republican candidate, who supported the gold standard, though he pledged himself to promote action by international agreement. In 1897 he sent commissioners to Europe, whose chief propositions to the British government were that it should purchase annually £10,000,000 of silver and the Indian mints be reopened. The Indian government, however, declined to agree to the second suggestion, and no action resulted. See **SILVER, FREE COINAGE OF.**

BIMONTHLY, a. *bī mōnth'li* [L. *bis*, twice, and *month*]: strictly every two months, or during two months; but used now to signify 'twice a month': see **BIENNIAL**.

BIN or **BINN**, n. *bīn* [AS. *bin*, a manger, a hutch: Ger. *benne* a sort of basket: Sw. *binge*, a heap—*lit.*, a heap]: a large wooden box or chest with a lid, used for corn or flour, etc.; a compartment in a wine-cellar.

BIN [L. *bini*, two by two]: a prefix meaning double; by twos; of two; another form of *bis*, twice.

BINAB, *be-nâb'*: town of Persia, province of Azerbaijan, charmingly situated on the banks of the Sôfi Chai (a feeder of Lake Urumiyah), in the midst of orchards and vineyards, about 55 m. s.s.w. of Tabriz. The streets are very clean, many of them having a stream of pure water flowing down the centre. B. forms a dependency of Marâghah, paying 4,000 tó máns of revenue, and furnishing a quota of 400 men to the Azerbaijan army. B. contains abt. 1,500 houses.

BINARY, a. *bī'nēr-ī* [F. *binaire*, binary—from mid. L. *bināriūs*, consisting of two things—from L. *bini*, two by two]: consisting of two, or two parts; dual; in *astron.*, applied to double stars; in *chem.*, applied to compounds consisting of two elements: N. constitution of two. **BINATE**, a. *bī'nāt*, growing in pairs; double.

BINARY COMPOUND: see **BINARY THEORY**.

BINARY THEORY, *bī'nēr-ī*, in Chemistry: a theory taking cognizance of the mode of construction of salts. It assumes that all salts contain merely two substances, which either are both simple, or of which one is simple, and the other a compound acting as a simple body. The best and most familiar illustration of the binary theory is common salt or chloride of sodium (NaCl), which is composed of the metal sodium (Na) and the non-metal chlorine (Cl), and is at a glance seen to be a *binary compound* (a compound of two). In like manner, fluor-spar, or the fluoride of calcium (CaF), consists of the metal calcium (Ca) and the non-metal fluorine (F); iodide of potassium (KI), largely employed in photography, of potassium (K) and iodine (I); and bromide of silver (AgBr), also useful in photography, of silver (Ag) and bromine (Br). Considerable difficulty is experienced in including all salts under the binary theory, but in many cases the apparent difficulty may be (and has been) surmounted. But though the B. T. attracted much attention 1837-55, and was adopted by Liebig and many other chemists, it never met general acceptance, and has now been quite superseded. See **ACIDS: SALTS: CHEMISTRY**.

BINASCO, *be-nâs'ko*: town of Lombardy, about 11 m. n.w. of Pavia. It is defended by a castle, where, 1418, Sep., Beatrice di Tenda, wife of the duke Filippo Maria, was beheaded by order of her husband, who unjustly suspected her of infidelity. Pop. abt. 1,000.

BINAURAL, a. *bīn aw'rāl* [L. *bīnus*, double; *auris*, the ear]: having a double ear-piece: N. a stethoscope having a double ear-piece.

BIN-BIRKILISA—BING.

BIN-BIRKILISA, *bîn-bēr-kîl-îs-a'* (One Thousand and One Churches): name of extensive ruins in the pashalic of Karamania, Asia Minor, 20 m. n.n.w. of the town of Karaman. The ruins consist chiefly of the remains of Byzantine churches, evidently of great antiquity.

BINCHÉ, *bîn'kéh*, or *bink*: town of Belgium, province of Hainaut, on the Haine, about 10 m. e.s.e. of Mons. It is well built and walled, with a fine square, ornamented with a fountain, and has manufactures of leather, cutlery, pottery, glass, etc., and considerable trade in lace, paper, marble, and coal. Pop. (1884) 9,441.

BIND, v. *bînd* [AS. and Goth. *bindan*, to bind or tie: Icel. *binda*, to bind or knot (see BUNCH)]: to tie together; to fasten; to confine or restrain; to oblige by a promise, an oath, or an agreement; to form or sew on a border; to render costive or hard. **BIND'ING**, imp.: N. the cover of a book, etc.: **ADJ.** obligatory. **BOUND**, pt. and pp. *bound*. **BIND'ER**, n. a person or thing that binds; the braid, band, or cord that confines the edges of a piece of cloth; a bandage. **BINDERY**, n. *bînd'ér-î*, a binder's workshop. To **BIND TO**, to attach to by service or obligation. To **BIND OVER**, to secure under a penalty that an appearance shall be made, or that an obligation be observed, as 'to bind over to keep the peace'—**SYN.** of 'bind': to tie; oblige; compel; constrain; coerce.

BIND, n. *bînd*, or **BINE**, n. *bîn* [Ger. *bund*, a bunch, a truss]: a miner's term for tough, argillaceous, or clayey shales.

BINDRABAN, *bin'dra-bân'*: town on the right bank of the Jumna, in the dist. of Muttra and lieut. governorship of the N. W. Provinces. It is in lat. 27° 34' n., long. 77° 45' e; 823 m. n.w. of Calcutta, and 92 s. of Delhi. The performance of religious rites appears to be the principal business of the place. Crowds of pilgrims come from all parts of India, particularly in honor of Krishna; and, through the munificence of wealthy devotees, sacred edifices are constantly becoming more numerous and costly. Here, as at Benares, the immediate margin of the river is occupied by flights of steps, or ghauts, as they are called. These extend for about a mile along the bank, being constructed of red stone from Jeypore, nearly 150 m. distant. Pop. (1881) 21,467; almost exclusively Hindu; (1891) 31,611.

BIND'WEED: see CONVULVULUS.

BINE, n. *bîn*, or **BIND**, n. *bînd* [Icel. *binda*, to bind: Lith. *pînnu*, to wreath, to plait: L. *vinĕā*, a vine]: the winding stem of a climbing plant,—thus, **HOP-BINE**, the shoots of hops. **WOODBINE**, the honeysuckle. **BIND-WOOD**, or **BINWOOD**, in *Scot.*, the ivy. **BINDWEEDS**, wild plants with twining stems; convolvuluses; leafy plants of the genus *Convolvulus*, ord. *Convolvulacæ*.

BINERVATE, a. *bî-nér'vât*: in bot., two-nerved — applied to leaves which have two raised 'nerves' or 'veins.'

BING, n. *bîng* [Sw. *binge*; Icel. *bingr*, a heap: Icel. *bunga*, to swell: *Scot.* *bing*, a heap—perhaps connected

with BIN 1]: a heap; a miner's term for a heap of ore or other mineral of a certain size.

BINGEN, *bīng'en* (ancient *Vincum* or *Bingium*): town in the grand-duchy of Hesse-Darmstadt, Germany; in a charming country on the left bank of the Rhine, and on the right of the Nahe, here crossed by a bridge, generally supposed to have been built by the Romans and called the Bridge of Drusus. The people are busied chiefly in the manufacture of fustian, leather, flannel, and tobacco. The vine is extensively cultivated in the surrounding country. The celebrated Scharlachberger wine is produced in the vineyard of that name, near the village of Rüdesheim. In the vicinity of the town is the Rochusberg, with a chapel, to which annual pilgrimages are made. On the declivity of the hill are still the ruins of the old castle (blown up by the French, 1689), in which the emperor Henry IV. was detained a prisoner by his son in 1105. On the other side of the Nahe is the Rupertsberg, with the ruins of a monastery, in which St. Hildegarde resided in the 12th c. Below the town is the celebrated *Bingerloch*, formerly a very dangerous point in the navigation of the Rhine, on account of the sunk rocks which, with the exception of a narrow passage through which the waters rushed loud and furious, stretched across the river; but, 1834, these rocks were blown up. In the middle of the river stands the tower in which Bishop Hatto (q.v.) was said to have been devoured by rats. Pop. (1885) 7,215; (1890) 7,654.

BINGHAM, *bīng'am*, HIRAM: missionary: 1789, Oct. 30—1869, Nov. 11; b. Bennington, Vt. He graduated at Middlebury Coll. 1816, and at Andover Theol. Seminary 1819, where he was ordained to the Congl. ministry. He immediately applied for an appointment as missionary, and was sent to the Sandwich Islands 1819. Here he remained for 20 years, preaching and teaching indefatigably, and obtaining strong influence with the Hawaiian rulers. Soon after B. was stationed on the island of Oahu, the cap., Honolulu, was established there, and this port was frequently visited by whalers and trading-ships, giving him a most favorable reputation at home. He returned 1841 to the United States.

BINGHAM, JOHN A.: lawyer and diplomat: 1815—1900, Mar. 20; b. Mercer, Penn. His early education was limited, and he was employed two years in a printing office, and though he studied at Franklin Coll., Ohio, he left without graduating. He gave some time to the study of law, was admitted to practice 1840, and was district atty. for Tuscarawas co., Ohio, 1845—49. In 1854 he was elected to congress as a republican, and held his seat till 1863. During this period he was placed in charge of the report on the contested Ill. elections, and was chairman of the managers in the impeachment of Judge Humphreys for high treason. Pres. Lincoln appointed him judge-advocate in the army and solicitor of the court of claims 1864, and he was special advocate in the trial of the assassins of Lincoln. He was U. S. minister to Japan 1873—85.

BINGHAM—BINGHAMTON.

BING'HAM, JUDSON DAVID: military officer: 1831, May 16—————; b. Massena Springs, St. Lawrence co., N. Y. He graduated from the Milit. Acad. at West Point 1854, and his first experience in active service appears to have been in the suppression of John Brown's raid at Harper's Ferry 1859. Later, and till 1862-3, he had charge of supplies and trains in Md., and in connection with the army of the Tennessee. He was at the siege of Vicksburg, and in the march through Georgia. He was made brev. brig.-gen. 1865, Apr. 9. After the war he held important positions, reaching the rank of lieut.col. U. S. A., and chief quarter-master of the division of the Missouri 1886, June 4.

BING'HAM, WILLIAM: senator: 1751-1804, Feb. 7; b. Philadelphia. He graduated at Philadelphia Coll. 1768. He was a delegate from Penn. to the Old Congress 1787-8, and senator 1795-1801. He gave strong support to Pres. Adams. B. had great wealth for those times, and purchased (1793) 2,000,000 acres of land in Maine. He died in Bath, England.—His wife, ANNE (WILLING) B. was noted in Philadelphia society for her personal charms and her generous hospitality. Her portrait was painted by Gilbert Stuart.—His eldest daughter, ANNE LOUISA (B.) married (1798) Alexander Baring, afterward Lord Ashburton, negotiator of the Webster-Ashburton treaty. She died 1848.—His 2d daughter, MARIA MATILDA (B.), was married three times, her first husband being James Alexander, Comte de Tilly; her second, Henry Baring, bro. of Lord Ashburton; and her third, the Marquis de Blaisel.

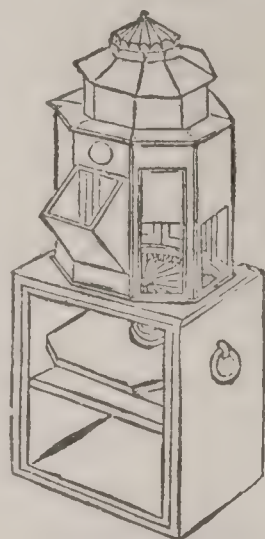
BINGHAMTON, *bīng'am-ton*: county seat of Broome co., N. Y.; pleasantly situated on both sides of the Susquehanna river at the mouth of the Chenango. Lofty hills confine the valleys of both rivers so that Indian paths, turnpikes, and railroads have each in turn been obliged to cross at this spot. B. has in consequence become a great railroad centre. The Chenango canal, 97 m. long, built 1834-36 at a cost of \$2,782,124, connects it with Utica and the Erie canal. B. is on the Erie railroad, 215 m. n.w. of New York, 208 m. s.e. of Buffalo. Other railroads connect it with Syracuse, Albany, and Wilkesbarre (Pa.). This place, first settled by William Bingham of Philadelphia, 1787, and named after him, was incorporated as a town, 1818, and as a city, 1867. The abundant water-power afforded by both rivers gave manufacturing enterprise a great impulse, and when this was superseded by steam, B. again found decided advantages in its nearness to the Pennsylvania coal-fields. It has considerable flour and lumber trade, and manufactures various kinds of machinery, leather, boots and shoes, carriages, and combs. Its streets are wide and well-paved, and its rivers spanned by half a dozen bridges. Gas is supplied by a private corporation. The city has a park s. of its limits and within 4 m. of the Pennsylvania line, a state asylum for the insane, an orphans' home, a home for the indigent, two Rom. Cath. parochial schools, 17 churches, 11 national and state banks, and 13 periodicals of all kinds. The property valuation was (1902) \$20,588,803; public debt, \$694,000; annual expenses, over \$100,000. Pop. (1890) 35,035; (1900) 39,647.

BINGLEY—BINOCLE.

BINGLEY, *bīng'lē*: town and township in the West Riding of Yorkshire, 15 m. w.n.w. of Leeds; on an eminence in a well-wooded district. It consists chiefly of one long street. It has worsted, cotton, and paper manufactures. Pop. (1881), town, 9,465; (1891) 10,023.

BINNACLE, or **BINACLE**, n. *bīn'ā-kl* [formerly written **BITTACLE**, n. *bīt'ā-kl*—from Port. *bitacola*; F. *habitacle*, an abode—from L. *habītae'ulum*]: a wooden box or case for containing a ship's compass, with other apparatus (especially a lamp) essential to its use. In large ships, there are generally two binnacles, one for the steersman, and one for the officer or seaman who 'cons' or superintends the steering. Sometimes a lamp is so placed as to illuminate two compasses at night, sometimes only one. Many improvements have recently been made in binnacles. See **COMPASS**, **MARINER'S**.

BINNEY, *bīn'nī*, **AMOS**: naturalist: 1803, Oct. 18—1847, Feb. 18; b. Boston. He graduated at Brown Univ. 1821. His *Terrestrial Mollusks of the United States*, 3 vols. (1847–51), was the first great work on the subject. His tomb at Mount Auburn is notable for its beauty.—**WILLIAM G.**, his son, pursued the same line of investigation, and works by him have been issued by the Smithsonian Institution.



Usual form of
Binnacle.

BIN'NEY, **HORACE**: eminent jurist and mem. of congress: 1780, Jan. 4—1875, Aug. 12; b. Philadelphia. He is known by his reports of Penn. supreme-court decisions, his *Inquiry into the Formation of Washington's Farewell Address* (1858), and his defense of Pres. Lincoln's suspension of habeas corpus writs.

BIN'NEY, **THOMAS**, D.D., LL.D.: 1798–1874; b. Newcastle, Eng.: one of the most distinguished modern preachers of the Congregationalists in England. After officiating as a clergyman in Newport, Isle of Wight, he removed to London, 1829, where he acquired extensive popularity. The hall in which he preached becoming too small for his congregation, Weigh-house Chapel, near London Bridge, was erected for him by his hearers, 1833. Here he continued with great success for 40 yrs. Among the most popular of his religious works are: *Conscientious Clerical Nonconformity*, *The Practical Power of Faith*, *Service of Song in the House of the Lord*, *Money*, and *Is it Possible to Make the Best of Both Worlds?* See *Memorial of B.*, edited by John Stoughton, D.D., 1875.

BINOCLE, n. *bīn ō-kl* or *bī-nō'kl* [L. *binus*, double; *oc ūlus*, an eye]: a telescope fitted with two tubes for both eyes. **BINOCULAR**, a. *bī-nōk' ū lēr*, having two eyes; employing both eyes at once—as *binocular vision*. **BINOCULAR GLASSES**, opera or field glasses made double for both eyes,

BINOMIAL—BIOBIO.

BINOMIAL, n. *bī-nō'mǐ-ăl* [L. *bis*, twice; *nōmen*, a name]: in *alg.*, a quantity consisting of two terms connected by the sign plus (+), or minus (−): **ADJ.** pertaining to; or **BINOMINOUS**, a. *bī-nōm'ī-nūs*. **BINOMIAL SYSTEM**, in *bot.* or *zool.*, the system according to which every plant or animal receives two names, the one indicating the *genus* to which it belongs, the other being its own *specific* name—as *Exogonidium purga*, the jalap plant; *Canis familiāris*, the domestic dog. **BINOMIAL THEOREM**, in *math.*, that remarkable series or analytical formula by which any power of a B. can be expressed and developed. Thus, the 8th or any other power of $a + b$ can be at once written down without going through the actual multiplication of $a + b$ by itself for the given number of times. The older mathematicians were acquainted with this theorem in the case of integral exponents, though the actual discoverer is unknown. Newton was the first to demonstrate its truth for all exponents—fractional and negative, as well as integral. It is one of the finest of his discoveries, and is engraved on his tomb. Among its many applications, it affords the means of finding any root of any number much more conveniently than by the usual method of extraction.

BINONDO, *be-non'do*: town of the island of Luzon, Philippines, on the right bank of the Pasig, opposite Manila, with which it is connected by a magnificent stone bridge, 411 ft. in length. This bridge is regarded as the greatest structure erected by Europeans in the East. B. is chiefly inhabited by natives of the Philippines, but is also the residence of some Europeans. It is the seat of govt. of the province of Tondo. Pop. 26,458.

BINOT, n. *bī-nōt'*: a kind of double mold-board plow.

BINOTONOUS, a. *bī-nōt'ō-nūs*: consisting of two notes, as the song of some birds.

BINOUS, a. *bī'nūs* [L. *bīni*, two by two]: double; in a pair, as leaves.

BINOXALATE, n. *bīn-ōks'ăl-āt* [L. *bis*, twice; Gr. *oxālis*, a kind of sorrel—from Gr. *oxus*, acid]: a combination of two equivalents of oxalic acid with one equivalent of a base. **BINOX'IDE**, n. *-ōks'id* [L. *bis*, twice, and *oxygen*]: the second degree of oxidation of a metal or other substance—better written *dioxide*.

BINTANG, *bīn'tāng*: island of the Dutch East Indies, about 40 m. s.e. of Singapore; lat. 1° 5' n., long. 104° 29' e.; 454 sq. m. It is calculated that not less than 4,000 tons of the astringent gum called gambir are obtained here annually. This, with rice and pepper, forms its chief export. Pop., including that of small adjacent isles, 18,000.

BINTURONG, *bīn'tu-rong* (*Ictides*): genus of quadrupeds nearly allied to Raccoons (q.v.), from which the chief distinction is in the smaller and less tuberculated back molar (grinder) teeth. Only two species are known, natives of Malacca, Java, Sumatra, etc.

BIOBIO, *bē'o-bē'o*: largest river of Chili; it has a w.n.w. course from the Andes to Concepcion on the Pacific, being

BIOCELLATE—BIOGRAPHY.

2 m. wide at its mouth, and navigable for boats from the sea to the mountains. Its lower stream separates the province of Concepcion on the n. from independent Araucania on the s.

BIOGRAPH, also called the **CINEMATOGRAPH**, **VITOSCOPE**, etc.: an apparatus that displays a series of photographs in rapid succession, giving the appearance of objects in motion. A long celluloid film is unwound from a cylinder and passing in front of the lens of a camera is given rapid exposures. From these negatives positives on transparent films are printed, and exposed in a stereopticon in exactly the same manner as the pictures were taken, each picture stopping an instant to be thrown upon a screen. The stopping of the film is so rapid that the appearance of smooth continuous motion is produced. The exposures are taken at a rate of from 25 to 50 per second, and the rolls range in length from 50 to 200 feet, making from 800 to 3,000 separate pictures. The biograph differs from its predecessor, the kinetoscope, in that instead of showing small pictures through an enlarging lens it projects them upon a screen. They are used extensively in theatres to give reproductions of parades, athletic tournaments, prize fights, dances, etc.

BIOGRAPHY: department of literature which treats of the lives of individuals. The mode of treatment, especially in modern times, is far from uniform. In some cases, B. approaches the sphere of philosophy; in others, that of history; while in the majority it assumes, to a large extent, the character of analytic or descriptive criticism. To none of these modes, theoretically considered, can there be any valid objection; everything depends on the judiciousness of the biographer. The great points which he must keep perpetually in view are the personality and characteristics of his subject. If these are buried under a load of digressive dissertations, his book, however valuable or interesting, ceases to be a B., except in name. Anciently, B. was more of a mere *curriculum vitæ* than it is now; the leading incidents of a man's life were narrated in their historical sequence, without any elaborate attempt to analyze the character from which they emanated. Like ancient history, it had a simple greatness, a stately dignity of narrative, colored here and there but sparingly with grave eulogy or censure. Modern B., on the other hand, like modern history, is full of elucidations, criticism, and disquisition; and though wanting in the severe grace of its classic predecessor, it is much more lively, acute, and expansive.

Biographical literature appears to have existed from a very early period. The oldest historical books of the Jews abound with beautiful examples of it, such as the lives of the patriarchs and the story of Ruth. But what, indeed, are the mythologies of all ancient nations except a chaos of heroic or divine biographies written not on walls of stone or rolls of parchment, or leaves of papyrus, but on the tablets of the memory? Of purely biographical works, the most valuable that has come down to us from the Greeks is the *Parallel Lives* of Plutarch, a composition of the 2d. c. after Christ. Roman literature also possesses an

admirable specimen in the *Life of Agricola* by his son-in-law, Tacitus. Besides these may be mentioned the *Life of Alexander the Great* (in Latin) by Curtius, and of *Apollo-nius of Tyana* (in Greek) by Philostratus, *Lives of the Sophists* (in Greek) by Philostratus, and a *Life of Plato* (in Greek) by Olympiodorus of Alexandria.

Of later date is St. Jerome's *Lives of the Fathers*; while biographies, more or less complete, of saints, martyrs, bishops, etc., are scattered profusely through primitive ecclesiastical literature. The monks of the middle ages also worked hard at the manufacture of absurd and superstitious legendary biographies. Modern biographical literature may be said to date from the 17th c., and has been developed to an extraordinary extent. Among biographical works, some are universal, as Michaud's *Biographie Universelle* (1811-28; new ed. 45 vols. 1842-66); Bayle's *Dictionnaire Historique et Critique* (1697); Chalmers's *Biographical Dictionary* (32 vols.); Vapereau's *Dictionnaire Universel des Contemporains* (new ed. 1893). Others discuss the lives of certain classes of men, as Vasari's *Lives of the Painters* (Florence, 1550); the *Acta Sanctorum* (q.v.); Johnson's *Lives of the Poets* (1781); Grove's *Dictionary of Musicians* (1879). Some are for certain countries only: thus Fuller's *Worthies of England* (1662); *Biographia Britannica* (1747); Appleton's *Cyclopædia of Amer. Biography* (1886-88); Sparks's *American Biography* (1834); Leslie Stephen's *Dictionary of National Biography* (1885).

Individual biographies may be remarkable for their literary charm, for the character of their subject or the interesting events of his life, or mainly for the fulness of the light they throw on his surroundings. Some biographies combine these excellencies in various degrees. Of English biographies, Boswell's *Johnson* and Carlyle's *John Sterling* are generally admitted to rank foremost. Other important works are Southey's *Nelson*, Moore's *Byron*, Lockhart's *Scott*; and more recently, Lewes's *Goethe*, Morley's *Diderot*, Trevelyan's *Macaulay*, Martin's *Life of the Prince Consort*, Froude's *Carlyle*. Elements of theological controversy are in Stanley's *Arnold*, Stopford Brooke's *Robertson* (of Brighton), as political argument is in Morley's *Cobden*. Carlyle's *Cromwell* and *Frederick*, and Masson's *Milton*, are largely historical of the times of their subjects. America has Washington Irving's *Columbus*, Sparks's *Washington*, Parton's *Franklin and his Times*, with others as nameworthy. In France there are famous biographies by Fontenelle, Barignay, Voltaire, Mallet, Boissy d'Anglas, Villemain, Cousin; and in Germany, by Herder, Garve, Heeren, Varnhagen von Ense, Döring, Pertz, Haym, Otto Jahn, Droysen, and many others.

Autobiographies have also become abundant in this self-conscious age; but many of them have perennial charm and value. Gibbon's is one of the more notable English autobiographies; others are those of Hume and Cobbett. Of American works of the kind, probably Franklin's is the foremost. In England, more or less complete autobiographical books of recent date are those of Harriet

BIOLOGY-BIOT.

Martineau and of John Stuart Mill, Col. Meadows Taylor's *Story of My Life*, and Carlyle's *Reminiscences*. Goethe's *Dichtung und Wahrheit*, possibly the most delightful work that can be referred to this class, is unique; but its defect as an autobiography is, that it remains impossible to tell how much is *truth* and how much *poetry*, to use the author's own antitheses.

BIOLOGY, n. *bī-ōl'ō-jī* [Gr. *bios*, life; *logos*, a discourse]: the science which investigates the phenomena of life; whether vegetable or animal. The science of life embraces knowledge regarding the phenomena of organized beings as distinguished from the inorganic world. It may be divided into four main divisions: 1. Morphology (including Anatomy and Histology); 2. Distribution, geographical and geological; 3. Physiology, animal and vegetable; 4. *Ætiology*, or the discussion of the problems as to the causes and origin of life. Thus a large proportion of the several articles in this work on Zoology, Botany, Physiology of vegetables, animals, and the human subject, including such articles as Animal and Animal Kingdom, Animal Heat, Reproduction, Vegetable Physiology, belong to the wide subject of B., which also borders on the provinces of Psychology and Sociology. By B. is sometimes meant Physiology merely. See DARWINIAN THEORY. **BIOLOGIC**, a. *bī-ō-lōj'ik*, or **BIOLOGICAL**, a. *-ō-lōj'ī-kal*, relating to the science of life. **BIOLOGIST**, n. *-ōl'ō-jist*, one who treats of the phenomena of life.

BIOPHAGOUS, a. *bī-ōf'ā gās* [Gr. *bios*, life; *phāgo*, I eat]: applied to plants that consume living organisms, as the insectivorous Venus's fly-trap.

BIOPLASM, n. *bī-ō-plāzm* [Gr. *bios*, life; *plasma*, what has been formed]: living formative matter as distinguished from matter formed; the material through which every form of life manifests itself; called also PROTOPLASM (q.v.).

BIORNEBORG, *be-or'neh-borg*: seaport town of Finland, on the Gulf of Bothnia, at the mouth of the Kumo, 76 m. n.n.w. from Abo. Shipbuilding is carried on. Timber, pitch, and tar are the principal exports. Pop. (1891) 7,343.

BIOT, *be-o'*, EDUARD CONSTANT: 1803, July 2—1850, March; b. Paris; son of Jean Baptiste B.: Chinese scholar. He was one of the first to promote the introduction of railways in France; but his health failing, he retired from the public service, and gave his leisure to the study of Chinese and the history of the social organization of the Celestial Empire. He wrote a *Dictionnaire des Villes, etc., de l'Empire Chinois* (1842), and a multitude of *Mémoires* on Chinese subjects of scientific and social interest, printed in the *Journal Asiatique*, etc. His interesting work, *De l'Abolition de l'Esclavage Ancienne en Occident* (1840), was awarded a gold medal by the Institute.

BIOT, JEAN BAPTISTE: 1774, Apr. 21—1862, Feb. 3; b. Paris; French physicist and astronomer. He entered the artillery, but forsook the service for science; and in 1800 became prof. of physics in the Collège de France. He was made a member of the Institute, 1803. With Arago.

he was (1806) sent to Spain to carry out the measuring of a degree of the meridian. In 1815, the Royal Soc. of London elected him one of their 50 foreign members. In 1817, he visited England, and went as far north as the Shetland Islands, in order to make observations along the line of the English arc of meridian. His most valuable contributions to science are on the polarization of light; and his researches connected with ancient astronomy are also very valuable. Of his numerous writings may be mentioned *Traité Élémentaire d'Astronomie Physique*, 3 vols. (Paris, 1805); 3d ed., considerably augmented (1850), 6 vols., with vol. of plates—translated into English. *Traité de Physique*, 4 vols. (1816); *Précis de Physique*, an abridgment of the former in 2 vols. (1817), often republished; *Recueil d'Observations Géodésiques*, etc. (1821). B. contributed many excellent biographies of scientific men to the *Biographie Universelle*. Among the most important of his later works are *Recherches sur l'ancienne Astronomie Chinoise* (1840); *Mémoire sur la Constitution de l'Atmosphère Terrestre*, in the *Connaissance des Temps* (1841); and *Études sur l'Astronomie Indienne* (1862). In 1849, B. was made a commander of the Legion of Honor, and he was also a member of most of the learned societies in Europe.

BIOTITE, n. *bī'ō-tīt* [after M. *Bion*]: a variety of mica containing iron and magnesia.

BIPAROUS, a. *bīp'ār-ūs* [L. *bis*, twice; *pariō*, I bring forth]: having two at a birth; in *bot.*, applied to a cyme in which the main axis ends by giving off two new ones, and so forth, thus forming a dichotomous inflorescence. **BIPARTITE**, a. *-tīt* [L. *bipartitus*, divided into two parts—from *bis*, twice; *partitus*, divided]: divided into two parts, as a leaf; having two corresponding parts. **BIPARTITION**, n. *-tish'ūn*, the act of dividing or making into two corresponding parts. **BIPARTILE**, a. *-tīl*, that may be divided into two parts.

BIPECTINATE, a. *bī-pěk'tīn āt* [L. *bī*, two; *pecten*, comb]: in *bot.*, having two margins, each toothed like a comb.

BIPED, n. *bī'pěd* [L. *bīpědem*, two-footed—from *bis*, twice; *pedem*, a foot]: an animal having two feet. **BIPEDAL**, a. *bīp'ě-dāl* or *bī-pě'dāl*, having two feet. The term Biped is sometimes applied, as descriptive, to man, more frequently to birds, and scarcely admits of application to any other animal except a very few species of reptiles, some of which are batrachian (see **BATRACHIA** and **SIREN**), and some saurian (see **SAURIA**). The two-footed saurians may be regarded as a link between that order and serpents, the two-footed batrachians as connecting batrachians with fishes, other characters of resemblance being in both instances associated with this.

BIPELTATE, a. *bī pěl'tāt*: in *zool.*, having a covering like two small shields, or like a double shield.

BIPENNIS: a double-headed ax, the weapon which, according to ancient historians and artists, particularly distinguished those fabulous female warriors, the Amazons.

BIPETALOUS—BIRAMOUS.

BIPETALOUS, a. *bī-pět'ă-lūs* [L. *bis*, twice; Gr. *pet'alon*, a leaf]: having two flower-leaves or petals.

BIPINNATE, a. *bī-pīn'nāt* [L. *bis*, twice; *pinna* or *penna*, a feather]: in *bot.*, applied to a leaf divided and subdivided pinnately; having leaflets in pairs.

BIPINNATIFID, a. *bī'pīn-năt'ī-fīd* [L. *bis*, twice; *pinna*, a feather; *fīdo*, I cleave; *fīdī*, I cleft]: in *bot.*, having pinnatifid leaves, the segments of which are themselves pinnatifid.

BIPINNATIPARTITE, a. *bī'pīn-năt'ī-pār'tīt* [L. *bis*, twice; *pinna*, a feather; *partītus*, divided]: differing from bipinnatifid in having the divisions of a pinnatifid leaf extending to near the midrib.

BIPLICATE, a. *bī'pī-kāt* [L. *bis*, twice; *plīco*, I fold]: in *bot.*, doubly folded in a transverse manner, as in the section of some cotyledons or seed-lobes.

BIPOLAR, a. *bī-pō'lēr* [*bī*, and *polar*]: in *anat.*, having two attached processes, as some nerve-cells.

BIPONT, a. *bī'pont*, or **BIPONTINE**, *bī-pont'in* [L. *bipontinus*, now Deux Ponts, in Bavaria]: relating to books published in Deux Ponts.

BIPOROSE, a. *bī-pō'rōs* [L. *bis*, twice; L. *porus*; Gr. *poros*, a pore]: in *bot.*, having two rounded openings.

BIPUNCTATE, a. *bī-punk'tāt* [L. *bis*; *punctatus*]: having two punctures.

BIPUPILLATE, a. *bī-pū'pīl lāt*: in *entom.*, having two pupil-like markings, differing in color in the ocellus of a butterfly's wings.

BIQUADRATE, n. *bī-kuōd'rāt* [L. *bis*, twice; *quadrātus*, squared]: the fourth power of a number, or the square of the square. **BIQUADRATIC**, a. *-rāt'īk*, relating to the fourth power: N. an equation involving the fourth power. See **EQUATIONS**.

BIQUINTILE, n. *bī-quīn'tīl* [L. *bis*; *quintilis*, the fifth month of the Roman year, afterwards July]: an aspect of the planets, first noted by Kepler, when their distance from each other is $\frac{2}{5}$ of a circle, or 144 degrees.

BIR, *bēr* (ancient *Birtha*, Turkish *Bireh-jik*): town of from 1,800 to 2,000 houses of Asiatic Turkey, in the pashalic of Diarbekir; on the e. bank of the Euphrates; lat. 37° 3' n., long. 38° e.; on a steep hill above the river, the passage of which is here commanded by a castle. B. is surrounded by a strong wall flanked with towers; its streets are narrow, but clean; it has several mosques with tall minarets, a caravansary, a bazaar, and a ruined citadel and castle. Travellers and caravans from Aleppo to Diarbekir, Bagdad, Persia, etc., cross the Euphrates at this point. From B. Col. Chesney proposed to navigate the Euphrates by small steamers to its mouth in the Persian Gulf, a distance of 1,143 m. B., which signifies 'well,' is the prefix of several other small towns in Arabia.

BIRAMOUS, a. *bī-rā'mūs* [L. *bis*, twice; *rāmus*, a branch] having a limb divided into two branches.

BIRCH.

BIRCH, n. *birch* [AS. *birce*; Sw. *björk*; Dan. *birke*; Ger. *birke*, a kind of birch]: name of a tree; a bundle of twigs used as a rod of correction; the *Betula alba*, and *B. glutinosa*, ord. *Betulaceæ*. **BIRCH** or **BIRCHEN**, a. -*ën*, made of birch.

BIRCH (*Betula*): genus of plants of the nat. ord. *Amentaceæ* (q.v.), sub-order *Betulineæ*, the nat. ord. *Betulaceæ* of some botanists. In this order, or sub-order—which contains only the two genera, Birch and Alder (q.v.)—the flowers have merely small scales for their perianth; the ovary is two-celled, but the fruit—a small achene (q.v.)—is by abortion one-celled; the fruits and scales united form a sort of cone; and the leaves have stipules which



Common Birch (*Betula alba*).

soon fall off. They all are trees or shrubs, natives of temperate and cold regions.—The genus *Betula* is distinguished by 10–12 stamens, and winged achenia.—The COMMON B. (*Betula alba*) has small ovato-triangular doubly serrated leaves. It is a very beautiful forest-tree, abounding in the n. of Europe and of Asia, often forming large groves by itself. In the s. of Europe, it is found only on mountains of considerable elevation. It is a tree of rapid growth. In favorable situations, it attains the height of 60 or even 70 ft., with a diameter of $1\frac{1}{2}$ or 2 ft.; while on the n., or utmost alpine limits of vegetation, it appears as only a stunted bush. The bark is smooth and silvery white, and its outermost layers are thrown off as the tree advances in age. The smaller branches are very slender and flexible, and in a particularly graceful variety called

BIRCH.

the **WEeping B.** (*B. pendula* of some botanists), they are still more slender, elongated, and pendulous. The bark and leaves of the B. are, in some northern countries, used medicinally in cases of fever and eruptions. They are used also for dyeing yellow. The bark is sometimes employed in tanning, and is preferred to every other kind of bark for steeping nets, sails, and cordage. See **BARK FOR TANNING**. It is in some countries made into shoes, hats, drinking-cups, etc., and it is even twisted into a coarse



Common Birch: showing Catkin and Leaves.

kind of ropes. Portable boats made of it are used on the Volga. It is remarkable for durability. In many parts of the north of Europe, it is used instead of slates or shingles by the peasantry; and in Russia—the outer or white layers being subjected to distillation—there is obtained a reddish empyreumatic oil called **B. OIL**; it yields also the **B. TAR**, or *Degutt*, which is employed in the preparation of Russia leather. Dried, ground, and mixed with meal, B. bark is used in Norway for feeding swine, and, in times of scarcity, has even served for human food. The wood is in universal use in northern countries for the most various purposes. It is white, firm, and tough, and

is employed by wheelwrights, coopers, turners, etc. It is very much used in the manufacture of barrels for fish. It is much employed as fuel for smoking hams, herrings, etc., because of the flavor which it imparts. Much is made into charcoal for forges. The twigs are in general use for besoms. In the Highlands of Scotland, and in many other countries, the sap is not only used as a beverage in a fresh state, but is converted by fermentation into a kind of wine. To obtain it, a hole is bored in the stem, in spring, in an oblique direction, one or two inches deep, and a small tube is introduced to carry the sap into a vessel. From a strong stem, there often flows as much as from four to six quarts in a day. If the hole is again closed up each time with a wooden plug, covered over with clay or rosin, and the tapping is annually renewed in the same place, the tree sustains very little injury. B. sap is very beneficial in diseases of the kidneys and in cases of urinary calculus. It contains more than 2 per cent. of sugar.—The WHITE B. of N. America (*B. populifolia*) is a variety of the foreign *B. alba*, but is of not much value. It is found as far south as Pennsylvania. The wood is scarcely used.—The BLACK B. of the same country (*B. nigra*), sometimes called RED B., and very similar to the common B., produces very hard and valuable timber. It attains the height of 70 ft. It is not found further n. than Mass. The bark is greenish-brown, twigs reddish, the wood light-colored.—The CHERRY B., SWEET or BLACK B. (*B. lenta*), has dark-brown bark, sweet and aromatic, the twigs reddish-bronze, and the fine-grained timber reddish, used for cabinet-work; it is common in the n. United States and s. on mountains. The YELLOW or GRAY B. (*B. lutea*) has the bark of the trunk yellowish or silver-gray; tree not larger than *B. lenta*; in moist woods from N. England to Lake Superior and n. Two shrub B. occur: the LOW B. (*B. pumila*), 2–8 ft., N. J. and n.; and the DWARF B. (*B. glandulosa*), 1–4 ft., branches with wart-like dots, Alpine and n. The *B. excelsa* does not exist; *B. lutea*, the plant intended, was confused by the originator, Aiton, and by Regel, with *B. papyracea* or *B. niger*. Saplings of Amer. species are much employed for making hoops for casks.—The PAPER B. (*B. papyraceæ*) is found in the n. parts of North America. It attains the height of 70 ft. The bark of the young trees is of a brilliant whiteness. The bark is capable of division into very thin sheets, which have been used as a substitute for paper. It is used by the Indians for canoes, boxes, buckets, baskets, etc. Large plates of it are curiously stitched together with the fibrous roots of the White Spruce, and coated with the resin of the Balm of Gilead Fir. The wood is used for the same purposes with that of the common B.—The mountainous districts of India produce several species of this genus. Thin, delicate plates of the bark of *B. Bhojputtra*, a native of the mountains of Kumaon, are used for lining the tubes of hookahs, and are carried in great quantities to the plains of India for this purpose. They were formerly used in-

stead of paper for writing. *B. acuminata*, a native of the mountains of Nepaul, is a tree of 50–60 ft. high, covered with branches from the base, and of an oval form. Its wood is strong and durable.—The DWARF B. (*B. nana*) is a mere bushy shrub, seldom more than two or three ft. high, generally much less. It has orbicular crenate leaves. It is a native of the whole of the most northern regions of the globe, and is found in some parts of the Highlands of Scotland. It is interesting because of its uses to the Laplanders and other inhabitants of very northern regions, to whom it supplies their chief fuel, and the material with which they stuff their beds. Its seeds are the food of the ptarmigan, on which the Laplanders in a considerable degree depend. A similar shrubby species (*B. antarctica*) occurs in Terra del Fuego.

BIRCH, *bérch*, SAMUEL: 1813, Nov. 3—1885; b. London; son of the Rev. S. Birch, rector of St. Mary Woolnoth, London. B. was educated at Merchant Taylors' School. In 1834, he entered the public service under the commissioners of public records; and in 1836, he obtained the appointment of assistant in the dept. of antiquities, British Museum. In this capacity, B. acquired an extensive acquaintance with archæology in all its branches. He studied not only Greek and Roman antiquities, including numismatics, but applied himself with untiring zeal to Egyptian hieroglyphics. His success in this department gained the notice of the celebrated Chevalier Bunsen, who gladly availed himself of B.'s knowledge in the philological portion of *Egypt's Place in Universal History*. The chevalier, in his preface, thankfully acknowledged this assistance in the following terms: 'This English edition owes many valuable remarks and additions to my learned friend, Mr. Samuel Birch, particularly in the grammatical, lexicographic, and mythological part. That I have been able to make out of the collection of Egyptian roots, printed in the German edition, a complete hieroglyphical dictionary, is owing to him. To him also belong the references to the monumental evidence for the signification of an Egyptian word, wherever the proof exhibited in Champollion's dictionary or grammar is not clear or satisfactory. . . . The work may now be said to contain the only complete Egyptian grammar and dictionary, as well as the only existing collection and interpretation of all the hieroglyphical signs; in short, all that a general scholar wants, to make himself master of the hieroglyphic system, by studying the monuments.' After Bunsen's decease, B. was engaged to prepare for the press and edit the fifth and concluding volume of *Egypt's Place*, which he did admirably, bringing the results of discoveries from 1848 down to 1867. At the same time B. also prepared a second edition of the first vol., including the most recent investigations. B. was universally recognized as the foremost British Egyptologist. In 1844, he was appointed assistant keeper in the dept. of antiquities, and in 1861, keeper of antiquities. In 1862, B. received the honorary degree of LL.D. from the Univ. of St. Andrews, and from Cambridge in

1874, in which year B. was president of the great London congress of Orientalists. He was a corresponding member of the Institute of France (*Académie des Inscriptions et des Belles-Lettres*); also of the Acad. of Berlin, of the Acad. of Herculaneum, and of the Archæological Institute of Rome. B.'s principal publications are as follows: *Gallery of Antiquities selected from the British Museum by F. Arundale and J. Bonomi, with Descriptions by S. Birch* (1842); *Views on the Nile, from Cairo to the Second Cataract, drawn on Stone, from Sketches taken by Owen Jones and J. Gourry, with Historical Notices of the Monuments by S. Birch* (1843); *Catalogue of Greek and Etruscan Vases in the British Museum* (1851), drawn up in conjunction with Mr. Newton; *An Introduction to the Study of the Egyptian Hieroglyphs*, for Gardner Wilkinson's *Egyptians* (1857), and a new edition of Wilkinson's work (1879); *History of Ancient Pottery* (2 vols. 1858); *Description of the Papyrus of Nas-khem, Priest of Amen-ra, discovered in an Excavation made by direction of H.R.H. the Prince of Wales in a Tomb near Gournah at Thebes* (1863); and *Egyptian Texts* (1877). Besides his Egyptian and classical labors, B. also studied Chinese, and in that direction was author of the following brief contributions, viz.: *Analecta Sinensia*, short stories from the Chinese (1841); *The Friends till Death*, a tale translated from the Chinese (1845); and *Chinese Romance—the Elf in Foxes* (1863). B. likewise contributed papers to the *Archæologia*, to the *Transactions of the Royal Society of Literature*, the *Revue Archéologique*, the *Archæologische Zeitung*, and the *Zeitschrift für Aegyptische Sprache und Alterthumskunde*. He also wrote many articles for the *English Encyclopedia*, principally on Egyptian antiquities and hieroglyphics. In the same class of subjects, he was a much-valued contributor to Chambers's *Encyclopedia*. He died in London.

BIRCH, THOMAS, D.D.: 1705, Nov. 23—1766, Jan. 9; b Clerkenwell; son of a coffee-mill maker, a Quaker. He was at first an usher in different schools. Having taken priest's orders, 1731, he was presented, 1732, to a living in Essex, and in 1734 became chaplain to the Earl of Kilmarnock, who was beheaded, 1746. Appointed in the latter year rector of St. Margaret Pattens with St. Gabriel, Fenchurch street, London, B. was elected in 1752 one of the secretaries of the Royal Soc., a history of which he published in 4 vols., 4to, 1756-7. In 1761, he was preferred to the rectory of Deepdene, Surrey. His first literary undertaking, in which he was assisted by others, was *The General Dictionary, Historical and Critical*, 10 vols., 1734-41, founded on Bayle's celebrated work. He next edited the collection of state-papers of Thurloe, secretary to Oliver Cromwell, 7 vols., folio, 1742. His other works are: *Life of the Hon. Robert Boyle* (1744); *Lives and Characters of the Illustrious Persons of Great Britain*, the engravings by Houbraken, Gravelot, and Vertue (London, 1743-52); *Inquiry into the Share which King Charles I. had in the Transactions of the Earl of Glamorgan* (1747); *Historical View of the Negotiations between the Courts of England, France, and Brussels, 1592 to 1617* (1749); *Life of Tillotson*

BIRCH-PFEIFFER.—BIRD.

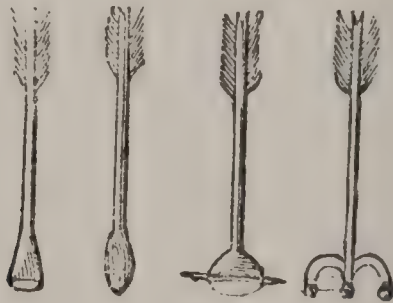
(1752); *Memoirs of the Reign of Queen Elizabeth* (2 vols, 1754); *Life of Henry Prince of Wales* (1760); etc. He edited the works of Sir Walter Raleigh, Bacon's works, and various others. He was killed by a fall from his horse in the Hampstead Road. He left an extensive MS. collection, with his library, to the British Museum, of which he was a trustee. From these MSS. were compiled *The Courts and Times of James I. and Charles I.*, 4 vols. 8vo (London, 1848).

BIRCH-PFEIFFER *birk-pfīfer*, CHARLOTTE: 1800–68, Aug. 25, b. Stuttgart; German actress and writer of plays. She made her debut at Munich at the age of thirteen, and afterwards played with great success at Berlin, Vienna, and Hamburg. In 1825, she married Dr. Christian Birch, of Copenhagen, and afterwards performed at Petersburg, Pesth, Amsterdam, and other places. In 1837, she undertook the direction of the theatre at Zurich. At a later period she acquired even greater renown as a writer for the stage than as an actress. Her principal theatrical pieces are *Pfefferrösel*; *Hinko*; *Die Günstlinge*, perhaps her best piece; *Der Glöckner von Notre Dame*; etc. In 1843, Madame B. resigned the direction of the Zurich theatre, and after visiting professionally most of the cities in Germany, made an engagement with the theatre-royal at Berlin. The chief productions of what may be termed her later manner are—*Die Marquise von Villette* (1845), *Dorf und Stadt* (1848), *Eine Familie* (1849), *Anna von Österich* (1850), *Ein Billet* (1851). In 1862 was published a complete edition of her dramatic works, about 70 in number, and a collection of her novels and tales. She died at Berlin.

BIRD, n. *bērd* [AS. *brīd*, the young of birds—from *brédan*, to breed: Ger. *brut*, a brood of young]: a feathered animal; a chicken; a young fowl: V. to catch birds. **BIRD-BOLT**, a small arrow. Stevens, in his note on *Much Ado about Nothing*, says the B. is 'a short thick arrow, without point, spreading at the extremity so much as to leave a broad flat surface, about the breadth of a shilling. Such are to this day in use to kill rooks with, and are shot from a cross-bow.' The annexed illustration is copied from Douce's *Illustrations of Shakspeare*. **BIRD'S-EYE VIEW**, seen at a glance; seen from a great height, as by a bird. **BIRD'S-EYE**, a plant—the *Primula farinosa*, ord. *Primulaceæ*—also applied to the *Veronica chamaedrys*, ord. *Scrophulariæcæ*; a variety of cut tobacco. **BIRD-CAGE**, an inclosure of wire or wicker-work for the confinement of birds. **BIRD-CALL**, a little stick cleft at one end, on which is put a leaf of some plant, for imitating the cry of birds; a short metallic cylinder, with a circular perforated plate at each end; used to make a trilling noise, as a decoy for birds. **BIRD-CATCHER**, one whose employment it is to snare birds. **BIRD-CHERRY**, a small tree, the *Prunus padus*. It has pendulous racemes of white flowers appearing in May, which are succeeded by small black drupaceous fruits. In N. Amer., any wild species, with small cherry-like fruits. **BIRD-CLASS**, a class for teaching birds to imitate

BIRD.

the notes of an instrument. There are generally about seven birds in a class. The principle is to shut the class up in a dark room, half-starving the performers till they imitate the instrument and gradually let in light upon them and partially feed them as a reward for singing. Learning to associate the singing with the gradual appearance of light and the exhibition of food, they sing to obtain these necessities. **BIRD-FANCIER**, one who makes a livelihood by trapping, keeping, and selling birds. **BIRDING-PIECE**, a gun to shoot birds with; a fowling-piece. **BIRD-LIKE**, resembling a bird. **BIRD-LIME**, any glutinous or sticky substance spread upon twigs for catching birds. **BIRD-LIMED** or **LIMED**, spread to ensnare. **BIRD-ORGAN**, a small organ used in teaching birds to sing. **BIRD-PEPPER**: see **CAPSICUM**. **BIRD'S-NESTS**, **EDIBLE**, nests built by the *Collocalia esculenta*, and certain other species of swallows inhabiting Sumatra, Java, China, and some other parts of the East. The nests, which are deemed a luxury by



Bird-bolts.

the Chinese, are formed of a mucilaginous substance, secreted by the birds themselves from their salivary glands. The nests are most prized when new, and are eaten only by the Chinese, who value this food on account of its aphrodisiac qualities. **BIRD-WILLED**, flighty; incapable of sustained attention. **BIRD-WITTED**, tending to roam from subject to subject; destitute of concentrativeness. **BIRD'S-EYE LIMESTONE**, a division of the Trenton group of the Lower Silurian of N. Amer., so named from the dark circular markings studding many portions of its mass; it contains the remains of brachiopods and many enormous orthoceratites. **BIRD-TONGUES**, a familiar term for fossil shark's teeth. **BIRD'S-EYE MAPLE**, curled maple, a species of wood used in cabinet-work.

BIRD, EDWARD: 1772—1819; b. Wolverhampton, Eng.: 'genre' painter. His father apprenticed him to a Birmingham tea-board manufacturer, his duty being to paint flowers, shepherds, etc., on the boards. On the expiration of his apprenticeship, B. established himself as a drawing-master in Bristol; and two of his pictures, the *Choristers Rehearsing*, and *The Will*, having been bought by the Duke of Clarence, afterwards William IV., and the Marquis of Hastings, his reputation was secure. He was elected a Royal Academician, and soon obtained some good commissions. The *Field of Chevy Chase the Day after the Battle* is gener

BIRD—BIRD-CATCHING SPIDER.

ally considered his masterpiece. His *Death of Eli* obtained the British Institution prize of 300 guineas. In 1813, B. was appointed painter to the princess Charlotte. He now became ambitious to excel in Scripture subjects, and painted several, none of which, however, added to his fame. His last picture, the *Embarkation of Louis XVIII. for France* which was never finished, was the least satisfactory of all his works. His most popular works are: *The Blacksmith's Shop*, *The Country Auction*, *The Village Politicians*, *The Young Recruit*, etc.

BIRD, ISABELLA L.: see BISHOP, ISABELLA L. (BIRD).

BIRD, FREDERICK MAYER, D.D.: Protestant Episcopal clergyman and author: 1838, June 28—————; b Philadelphia; son of Robert Montgomery B., novelist (1803–54). He graduated at the Univ. of Penn. 1857, and Union Theol. Sem., New York, 1860, and entered the Luth. ministry, was army chaplain in the civil war; then took orders in the Prot. Episc. Ch., and was in pastoral work till 1881, was prof. of psychology, Christian evidences, and rhetoric in Lehigh Univ., till 1886, then turned to literary work. He collected a great library of hymnology; was chief ed. of the Luth. *Hymn Book*; collaborator with Bp. Odenheimer in compiling *Songs of the Spirit*; contributed Amer. material to Murray's *Dic. of Hymnology*; wrote *Charles Wesley Seen in his Finer and Less Familiar Poems*; contributed many articles to the Amer. supplement to *Encyc. Britannica*, to *Columbian Cyc.*, etc.

BIRD-CATCHING SPIDER: name originally given to a large spider, *Mygale avicularia*, native of Cayenne and Surinam; but now more extensively applied, being equally appropriate to a number of large species of *Mygale* (q.v.) and *Epeira* (c.v.), perhaps also of other genera. It has, indeed, been denied by some observers that the name is truly appropriate, but the positive evidence is too strong to be easily set aside by evidence merely negative. The *Mygale avicularia* is nearly two inches long, very hairy, and almost entirely black; its feet, when stretched out, occupy a surface of nearly a foot in diameter. The hooks of its mandibles are strong, conical, and very black. This great spider forms a tube-shaped cell, widening towards the mouth, of a fine white semi-transparent tissue, like muslin, in clefts of trees or hollows among rocks and stones. From this it issues only at night, to prey upon insects, and, it is said, upon humming-birds. It does not construct a net for the capture of its prey, but takes it by hunting, as do other large species of *Mygale*, natives of the warm parts of America, the East Indies, and Africa. It is probably a species of this genus that Dampier mentions as found in Campeachy, the fangs of which, 'black as jet, smooth as glass, and at their small end as sharp as a thorn,' are said by him to be worn by some persons in their tobacco-pouches, to pick their pipes with; and to be by others used as toothpicks, in the belief of their having power to expel the toothache. The bite of the large species is said to be dangerous.

It appears that spiders of genus *Epeira* feed on small birds caught in their webs, which have even been de-

BIRD-CHERRY—BIRD LIME.

scribed as in some cases large enough to arrest the flight of a bird the size of a thrush, and to impede the traveller in tropical forests.

BIRD-CHERRY (formerly of genus *Padus* : a small sub-division of genus *Prunus*; the flowers of our species appearing after the leaves, unlike other wild cherries and plums, which also belong to *Prunus* and differ not generically from the old genus *Padus*. The foreign B., called in Scotland *Hagberry*, is a tall shrub or small tree, sometimes reaching the height of 40 ft., growing wild in moist woods in Europe and northern Asia. Its younger branches are of a very dark or reddish-brown color. The drupes are small, of a sweetish subacid taste, combined with a degree of what many regard as nauseous bitterness; but to some palates they are not disagreeable. A well-flavored spirituous liquor is prepared from them in the north of Europe. In Siberia, the juice expressed from the ripe fruit is drunk either alone or mixed with milk, and the remaining mass is kneaded into cakes, and used as food.—Nearly allied is the common **CHOKE CHERRY** (*P. Virginiana*), a tall shrub, N. Amer.; and the **WILD BLACK CHERRY** (*P. serotina*), a tree the wood of which is heavy, fine-grained, takes a fine polish, and is much used by cabinet makers. The bark is used as a febrifuge. The fruit is not agreeable; but a cordial is made from it by infusion in spirits with sugar, and, when dried and bruised, it forms an esteemed addition to *pemmican* (q.v.).

BIRDE, *bird*, **WILLIAM**: 1540-1623; distinguished ecclesiastical musical composer, educated at Edward VI.'s Chapel. In 1563, he was appointed organist in Lincoln Cathedral, and twelve years afterwards organist to Queen Elizabeth. He published numerous compositions exhibiting great musical learning, and contributed many pieces to Queen Elizabeth's *Virginal Book*; but his fame rests on the canon, *Non Nobis Domine*, which, amid all changes in musical taste, has retained its popularity.

BIRD-GRASS, n. (*Poa trivialis*): also called Rough-stalked Meadow-grass. Its culms are erect from a more or less decumbent base; sheathes and leaves somewhat rough, and roots fibrous: it resembles June-grass, but needs moist soil. It is grown more extensively in Great Britain than in this country.

BIRD ISLAND: n.w. island of the Sandwich archipelago; lat. 22° 20' n., and long. 160° w. It is, as its name implies, a mere haunt of sea-fowl. The links of this island-chain increase in size and elevation from B. I. on the n.w. to Hawaii on the southeast.

BIRD-LICE, n. pl.: the small parasites frequently infecting birds. Naturalists place them in the insect order *Mal'ophaga*, in immediate proximity to the *Anoplura*, which contains the human *pediculus*.

BIRD-LIME: a viscid and adhesive substance, placed on twigs of trees or wire-netting, for the purpose of catching

BIRD-NET—BIRD OF PARADISE.

the birds which may alight thereon. A common practice is to place a decoy or tame bird in a cage near where the B. is spread; the wild birds, attracted to the spot by the song of the tame bird, get entangled with the bird-lime. The substance is generally prepared from the middle bark of the holly, mistletoe, or distaff-thistle, by chopping up the bark, treating it with water, boiling for several hours, then straining; and lastly, concentrating the liquid by evaporation, when the B. assumes a gelatinous consistence resembling that of moist putty. It consists mainly of a substance named by the chemist *viscin*. A second mode of preparing B., is to employ ordinary wheat-flour; place it in a piece of cotton cloth; tie up the ends, so as to form a bag; immerse the whole in a basin of water, or allow a stream of water to flow upon it; and repeatedly squeeze the bag and its contents. The result is, that the starch of the wheat-flour is pressed out of the cloth bag, and an adhesive substance named *gluten* is left on the cloth. This substance resembles that prepared by the previous process in its properties; but is more expensive.

BIRD-NET, a net used for catching birds. It is about 12 yds. square, and laid flat on the ground, to which it is affixed by four iron pins, its sides remaining loose. Upon it is put a cage with a decoy-bird in it, given to singing cheerfully. When other birds congregate around it, the man, who has been lying concealed twenty or thirty yards off, pulls a string, which makes the loose sides of the net collapse and fly together, imprisoning the birds around the cage.

BIRD OF PARADISE: common name of a family of birds, *Paradiseidae* of ornithologists, found chiefly in New Guinea and neighboring islands, and remarkable for splendor of plumage. In all other respects, however, they are very closely allied to the crow-family, *Corvidæ* (q.v.), to which they exhibit a great similarity, not only in the characters of the bill, feet, etc., and in general form, but also in their habits, and even in their voice. They have been the subject of many fables. The state in which their skins are usually exported from their native islands gave rise to the notion that they were destitute of feet; and free scope being allowed to fancy, it became the prevalent belief that they spent their whole lives floating in the air, except when perhaps they suspended themselves for a little by their long tail filaments from the uppermost branches of trees. As for their food, it was supposed to be either mere dew and vapors, or nectar obtained from the flowers of trees, climbers, and plants growing on the branches of trees, in the high regions of bright sunshine above the shade of the tropical forests. Antony Pigafetta, indeed, who accompanied Magellan in his voyage round the world, described them as having legs, and stated that these were cut off as useless in the preparation of the skins; but his statement was not credited, and Aldrovandus went the length of accusing him of an audacious falsehood. It would seem that the fables

BIRD OF PARADISE.

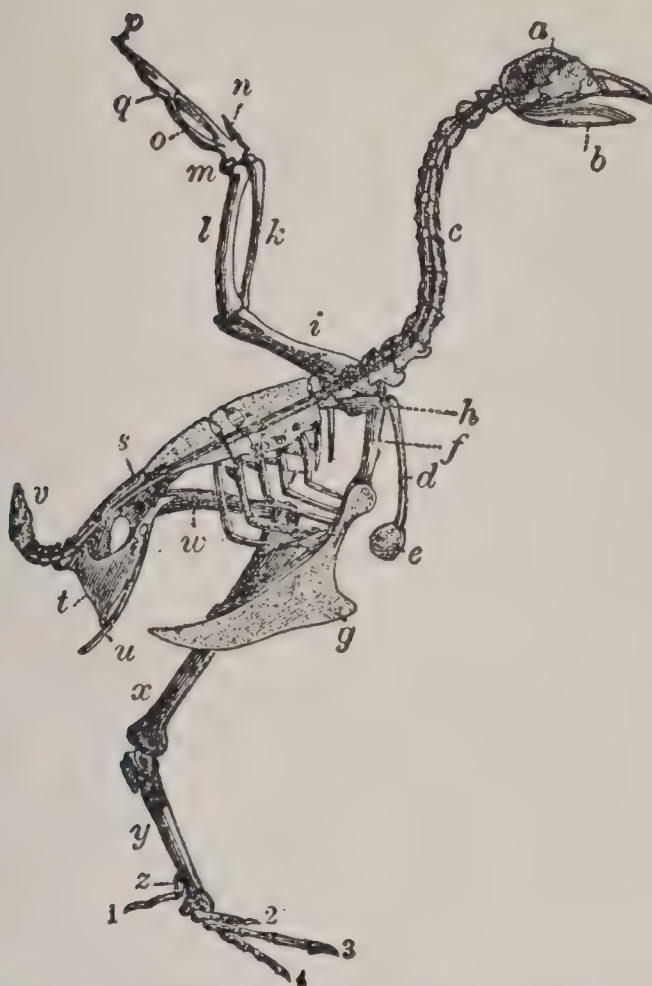
concerning the Birds of Paradise are in part to be ascribed to the desire of the inhabitants of those islands in which they are found to increase the value of their skins as an article of merchandise; and a sort of sacred character being attached to them, they were employed not merely for ornament, but as a charm to secure the life of the wearer against the dangers of battle. The people of Ternate call them *Manuco-Deuta*, or Birds of God; which name Buffon modified into *Manucode*. In different languages they are known by names signifying Birds of the Air, Birds of the Sun, etc.

The males alone are birds of splendid plumage, that of the females possessing neither brilliancy of colors nor remarkable development. The plumage of the males is not only

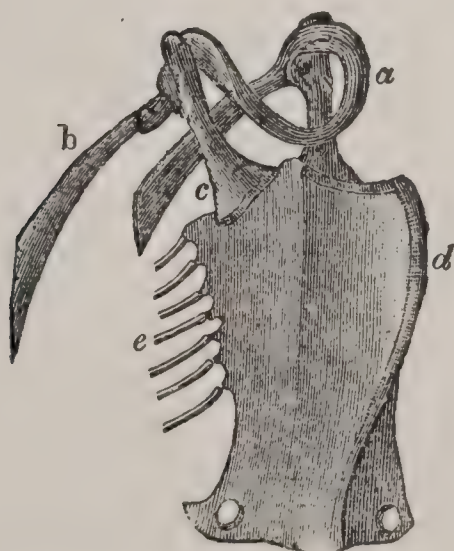


Bird of Paradise (*Paradisea apoda*)—male.

characterized by great brightness of tints, but by a glossy velvety appearance, a metallic lustre, and a singularly beautiful play of colors. Tufts of feathers generally grow from the shoulders, and these, in some of the kinds, are prolonged so as to cover the wings; in the species sometimes called the Common Bird of Paradise, and sometimes the Great Emerald Bird of Paradise (*Paradisea apoda*), the prolongation of these shoulder tufts is so great, that they extend far beyond the body, and even far beyond the tail. They constitute the most magnificent part of the well known Bird of Paradise plumes. They are exquisitely light and delicate. It has been supposed that they may be of use to the creature in enabling it, with less exertion of wing, to float in the air, but this notion seems confuted by the total absence of them in the female.—In other species, there are elongated feathers on the back of the neck, which the bird can erect, and even in some measure throw forward at pleasure; and these, in the genus *Lophorina*, &



Bird.—Skeleton of Fowl (exhibited in section): *a*, Brain cavity; *b*, Hyoid bone; *c*, Neck vertebræ; *d*, Clavicle; *e*, Interclavicle; *f*, Coracoid; *g*, Breast-bone; *h*, Scapula; *i*, Humerus; *k*, Radius; *l*, Ulna; *m*, Wrist; *n*, Thumb; *o*, United metacarpals; *p*, Second finger; *q*, Third finger; *r*, Ribs; *s*, Ilium; *t*, Ischium; *u*, Pubis; *v*, Plowshare-bone; *w*, Femur; *x*, Tibia; *y*, United metatarsals; *z*, Separate metatarsals; 1, 2, 3, 4, Toes.



Bird.—Breast-bone and Shoulder-girdle of Falcon: *a*, Clavicle; *b*, Scapular; *c*, Coracoid; *d*, Keel of sternum; *e*, Ribs.

BIRD OF PARADISE.

sume a form resembling that of a pair of outspread wings, and rise far above the head. The tail is, in general, not unlike that of a crow in its shape; but in many species there arise from the rump, at the sides of the tail, two very long feathers, or rather filaments, covered with a sort of velvety down: of these, the Common Bird of Paradise affords an example. In the King Bird of Paradise (*Cincinnurus regius*), these long tail-filaments terminate in a sort of disk, as the tail-feathers of the peacock do.

Birds of Paradise are, in general, more or less gregarious. They sometimes pass in flocks from one island to another, according to the change of seasons from the dry to the wet monsoon. Owing to their plumage, they fly more easily against than with the wind, and by high winds they are sometimes thrown to the ground. They are lively and active, and in confinement pert and bold. They bestow great care upon their plumage, and sit always on the perches of the cage, so that no part of it may reach the floor, or get in the least degree soiled. It has seldom been found possible to bring them alive to Europe, and they seem very incapable of enduring any other than a tropical climate. In confinement, they are easily fed on rice, insects, etc. In a wild state, their food consists in great part of the fruit of the teak-tree, and of different species of fig, and also of the large butterflies which abound in their native islands.

The Papuans kill Birds of Paradise by shooting them with arrows and employ various other means of taking them for the sake of their skins. The skins are dried in smoke, and fumigated with sulphur to preserve them from insects; and in this way the brilliancy of the color is impaired, so that the most gorgeous plumes which are ever seen in Europe are inferior, in this respect, to those of the living bird. The skin, to which great part of the flesh is allowed to remain attached, is always much contracted by this drying process, and a very erroneous notion is therefore often formed of the size of the bird. The common Bird of Paradise is as large as a jay. It is of a cinnamon color, the upper part of the head and neck yellow, the front and throat emerald green, the shoulder-tufts yellow. The whole length to the extremity of these is not less than two ft. Another nearly allied species (*Paradisea rubra*) has these long feathers of a brilliant carmine color.

BIRDS.

BIRDS (*Aves*): the second class of vertebrated (q.v.) animals, and the first of oviparous vertebrated animals, including all the oviparous animals which have warm blood. B. exhibit great similarity in their general structure, and are sharply distinguished from all other classes of animals. To this class belong all animals, except Bats (q.v.), which have an internal skeleton, and are capable of true flight. The anterior extremities of B. serve them only as wings or organs of flight, and never in any degree as arms or legs; those few birds in which the wings are too small to raise the body in the air generally employ them to aid their swift running upon land, as the ostrich, or for swimming under water, as the great auk and the penguins. The body is covered with feathers (q.v.), and this is one of the characters in which all birds agree, and by which they are distinguished from all other animals. The general form is adapted to motion through the air, and the trunk is compact and somewhat boat-shaped. The vertebral column possesses little flexibility; indeed, the vertebrae of the back generally become ankylosed or firmly united together by cementing bone, the solidity which is thus acquired being of evident use for the support of the ribs, and these also are proportionately stronger than is usual in quadrupeds; each of them is provided in the middle with a flattened bony process, directed obliquely backwards to the next rib, so that they support one another, while instead of being united to the sternum, or breast-bone, by cartilages, as in quadrupeds, they are continued to it in the form of bone; all these things combining to give strength to that part of the body in which it is particularly needed, both in order to the powerful action of the wings, and the perfect freedom of respiration during flight. In those birds, however, which do not fly, the vertebrae of the back retain some power of motion. The hinder part of the vertebral column exhibits a solidity even greater than the anterior part of it, the lumbar vertebrae (q.v.) being consolidated into one piece with the pelvis (q.v.), which furnishes attachment to strong muscles for the support of the trunk upon the legs, and for the motion of these organs. The vertebral column, however, terminates in a number of small movable (*corygeal*) vertebrae, the flexibility of this part being necessary to the motion of the tail, which is itself supported by a short and generally much elevated bone, regarded as consisting of ankylosed vertebrae, called the rump-bone, or, from its peculiar form, the plowshare-bone.

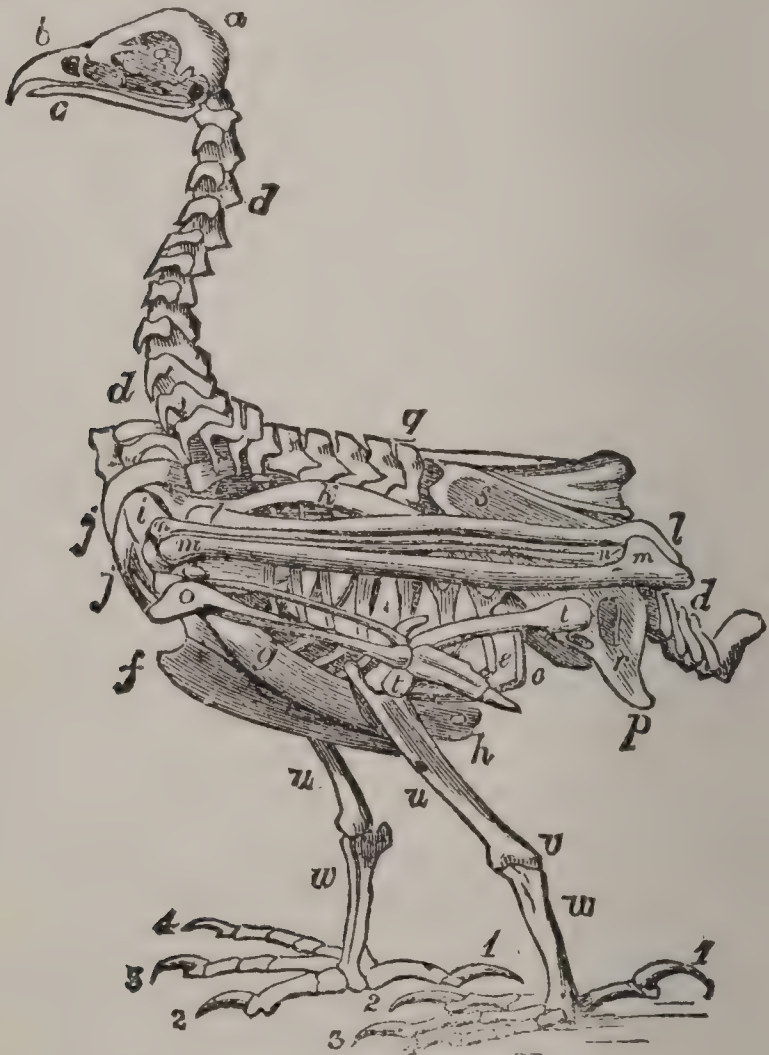
In contrast to the general stiffness of the vertebral column in the trunk, it is remarkable for great flexibility in the neck, enabling a bird to make ready use of its bill, or to bring its head into such positions as suit the adjustment of the centre of gravity in flying, standing, etc.

The number of vertebrae in the neck varies from 10 to 23, the smallest number being greater than is found in any quadruped. The head also is so articulated to the neck by a single *condyle*, or pivot, that a bird can turn its head round in a manner impossible to the mammalia. The skull itself is formed of bones corresponding with those of man and quadrupeds; but they can be distinguished only when

BIRDS.

the bird is very young, soon becoming consolidated together. The jaws are much elongated, so as to form the bill, the organ chiefly employed in seizing food, as well as for fighting, nest-building, dressing or preening the feathers, and instead of a *hand* for every purpose which bird-life requires. The upper mandible of the bill is so connected, however, with the bone of the skull, by elastic plates, that it possesses some power of motion, and any shock which it may receive is much deadened before reaching the skull. The bill affords many of the most important distinctive characters of B., differing very much according to the mode of life of different orders and tribes. See BILL.

The following illustration will serve to indicate the principal bones of a bird's skeleton; it is from M'Gillivray's *British Birds*.

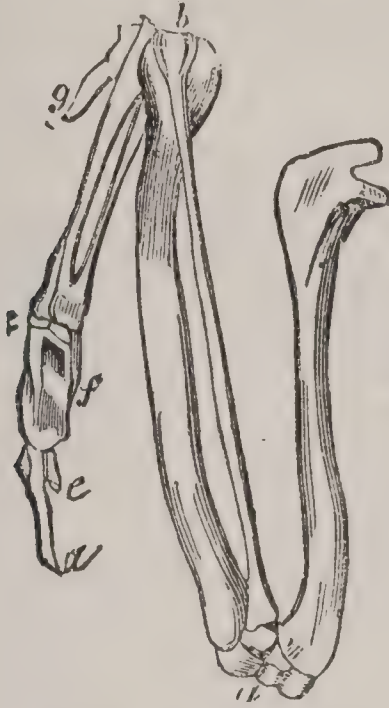


Skeleton of Golden Eagle:

a, cranium; *b*, upper mandible; *c*, lower mandible; *d, d*, vertebræ; *e, e*, ribs; *fgh*, sternum; *i*, coracoid bone; *jj*, furcula; *k*, scapula; *ll*, humeral bone; *mm*, ulna; *nn*, radius; *o*, metacarpal bones; *p*, *q*, united sacrum and pelvis; *r*, ischium; *s*, ilium; *tt*, thigh-bone; *uu*, tibia; *v*, ankle-joint; *ww*, tarsus; 1, first or hind toe; 2, second or inner toe; 3, third or middle toe; 4, fourth or outer toe.

The sternum or breast-bone in B. is remarkably large and strong, serving for the attachment of the powerful muscles which depress the wings, and receives great at-

tension from naturalists, because its variations correspond with the differences in some of the most important characters and habits of birds. It generally exhibits a projecting ridge along the middle, proportionately largest in birds of most powerful flight, and wanting only in

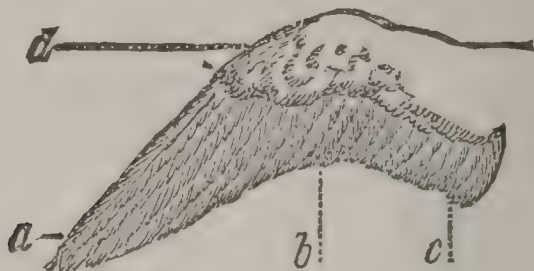


Skeleton of Bird's Wing.

ostriches and a few birds of allied genera which do not fly. The clavicles or collar-bones, also, are generally united to form the fourchette (*furcula*) or merry-thought bone, serving, along with two bones called the coracoid bones, to keep the shoulders separated, and to resist the compressing tendency of the action of the wings. The bones of the wing itself are regarded as corresponding to those of the anterior extremities in man and quadrupeds; the bones of the hand, however, being much disguised, and some of them wanting or rudimentary. In the accompanying cut of the bones of a bird's wing, *a* is regarded as the elbow-joint, *b* as the wrist-joint, *c* as the knuckle-joint, *d* being the representative of a finger, *e* and *f* the rudimentary representatives of two others, while the *winglet*, *g*, formerly regarded as representing the thumb, is now rather supposed to be homologous to the forefinger. The wings, therefore, exhibit a structure entirely different from those of bats, in which the fingers are extremely elongated. The surface necessary for striking the air is provided by feathers larger and stronger than those of other parts of the body, called *wing-feathers*, *quill-feathers*, or *quills*. Of these, which exhibit an admirable combination of strength with lightness and elasticity, some spring from the part of the wing between *b* and *d* (in the figure of the bones of the wing); these are always the largest, and are called the *primary* wing-feathers, or simply *primaries*; those which spring from the part between *a* and *b* are called *secondaries*; and those which spring from the

BIRDS.

part between *a* and the shoulder-joint, are called *tertiaries*. At the base of the quills, on both sides of the wing, are feathers called *wing-coverts*, and these are likewise distinguished as primary, secondary, etc. The feathers which grow over the shoulder-blades are called *scapulars*. The feathers of the wings vary in length and strength, according to the mode of life and power of flight in differ



Bird's Wing, Showing Quills:

a, primaries; *b*, secondaries; *c*, tertiaries; *d*, winglet.

ent B.; narrow, sharp, and stiff wings being indicative of swift and enduring flight. The tail-feathers serve the purpose of a rudder to guide the bird, and also that of balancing it in the air; they resemble in character the quills of the wings. They are also furnished with *coverts* above and below. Some B. have the tail rounded at the extremity; in some, it is square; in others, notched or forked. In many land B., the tail exhibits ornamental plumes, and remarkable developments of the plumage take place also in other parts of the body, in the form of crests, ruffs, shoulder-tufts, etc.

The legs of B. consists of parts corresponding to those found in man and quadrupeds; but the thigh is short, and so concealed within the body, that it is not apparent as an external portion of the limb; the next division, often mistaken for the thigh, being the leg strictly so called, or *tibia*, which ends at what is really the heel-joint, although popularly regarded as the knee; and beneath this is the shank, or *tarsus*, which in some B. is very long, serving as a part not of the foot but of the leg, and formed by a single bone which represents both the tarsus and metatarsus. The feet are divided into toes, generally four in number, three before and one behind, differing from each other in length and in the number of joints or phalanges of which they are composed, the toe, which is directed backward, being in general comparatively short, and consisting only of two joints. A fifth toe or tarsal spur is found in some of the gallinaceous B.; and in some B., as Bustards, the hind-toe is wanting; the ostrich has only two toes, both directed forward, with the obscure rudiment of a third; and numerous B. classed together in the order of Climbers (q.v.) or Yoke-footed B., including Parrots, Cuckoos, Woodpeckers, etc., have two toes before, opposed by two toes behind, the foot being thus particularly adapted for grasping, so that parrots, as is well known, even use it as a hand.—The feet of B. vary con-

siderably according to their mode of life; and naturalists therefore depend very much upon them in classification. In some the claws are strong and hooked; in others short, straight, and weak; in some the toes are all separate, in others more or less connected; in B. specially adapted for swimming, they are generally *webbed* or united by a membrane; in other swimming-B., however, a membrane extends only along the sides of each toe. In most B. the tarsus is feathered to the heel-joint; in some, however, and particularly in *waders*, the lower part of it is bare; the shank and toes are generally, although not always, destitute of feathers, and are covered with a scaly skin. Almost the only other parts of a bird often destitute of feathers are the *cere* at the base of the bill, and the combs and wattles of gallinaceous birds.

In order to flight, it is indispensable that the centre of gravity of a bird should be under the shoulders; and when a bird stands, the feet are brought forward, and the head thrown back, so that the claws project beyond a vertical line passing through the centre of gravity of the whole body. This is generally accomplished so that the trunk is in an almost horizontal position, the forepart only a little elevated; but in some B., which have a short neck and short legs, an erect attitude is necessarily assumed, so that the penguins of the southern seas present to navigators a somewhat ludicrous resemblance to regiments of soldiers on the beach. B., when they sleep, very generally place their head under their wing, and some of them also stand upon one foot, their equilibrium being thus more easily maintained. A remarkable contrivance, particularly to be observed in storks and other long-legged B., renders this posture unfatiguing: a locking of the bone of one part of the limb into a sort of socket in the bone of the part above it, so that it retains its place without muscular exertion; while a similar purpose is served by the tendons of the muscles which bend the claws passing over the joints of the leg in such a manner as to be stretched by the mere pressure there when the weight of the bird rests upon the legs, so that without any effort the claws retain a firm hold of the branch upon which it is perched.—Flying is accomplished by the action of the wings upon the elastic and resisting air; the muscles by which the stroke of the wing is given are powerful, those by which it is retracted are comparatively weak. Owing to the manner in which the first strokes of the wing must be given, few B. rise with facility from a level surface; and some of them, as swallows, and particularly swifts, rise from a perfectly level surface with great difficulty, and comparatively seldom alight where they cannot find an elevation from which, as it were, to throw themselves.

The digestive apparatus of B. resembles that of mammalia; exhibiting, however, various modifications, according to the different kinds of food—some B. feeding on flesh, others on fish, others exclusively on insects, others on seeds, others more indiscriminately on a variety of animal and vegetable substances. Few B. masticate their

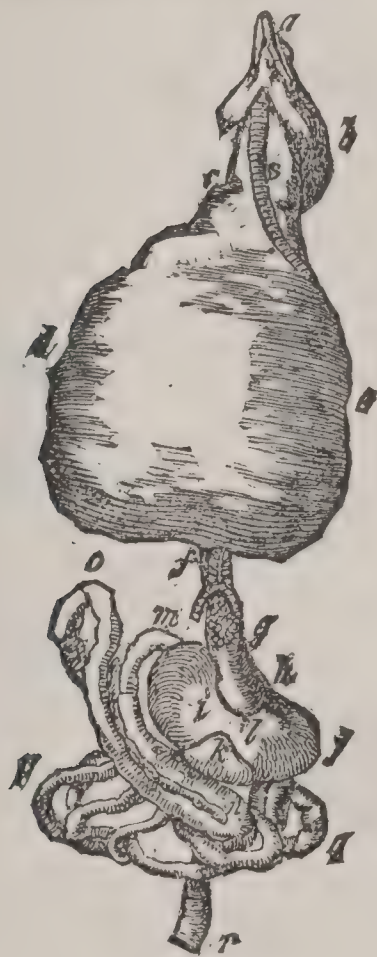
BIRDS.

food in any degree, though parrots do; upon being swallowed, it enters the *crop* or *crano*, sometimes called the first stomach, an enlargement of the esophagus or gullet, situated just before the breast-bone, and here it is moistened by a secretion, which is also by some B.—particularly by pigeons—employed as the first food for their young, the glands of the crop enlarging very much, so as to produce it in large quantity at the time when it is wanted for that purpose. The crop is wanting in the ostrich, and also generally in B. that feed on fish; and is of greatest size in those of which the food consists of seeds or grain. It is generally single, and on one side of the gullet; sometimes, as in pigeons, it is double. A second stomach, or dilatation of the esophagus, called the *proventriculus* or *ventriculus succenturiatus*, is generally largest in those B. in which the crop is wanting or small; and in this the food is further softened and changed by a secretion which is mixed with it. The third and principal stomach is the *gizzard*, which in B. of prey, fish-eating B., etc., is a mere membranous sac; but in B. which feed on grain or seeds is very thick and muscular, so that it acts as a sort of mill, and with extraordinary power. In these B., also, a remarkable provision is made for the perfect grinding down of the contents of the gizzard, by the instinct which leads them to swallow small rough pebbles or grains of sand, an instinct well exemplified in the common domestic fowl. The liver of B. is, in general, very large. The kidneys are large, but there is no urinary bladder, and the urine is at once poured into the *cloaca*, an enlargement of the intestine, at its termination, with which also the organs of generation communicate in both sexes. The following cut is from M'Gillivray's *British Brds.*

The respiration of B. is very perfect, and their blood is from 12° to 16° warmer than that of mammalia; its circulation more rapid, and the energy of all the vital processes proportionally great. B., consequently, exhibit great liveliness; and upon the admirable provision for the aëration of their blood they depend also for their powers of flight, which enable some of them to travel hundreds of miles with great rapidity and without exhaustion, while others soar to a prodigious height in the air. The heart resembles that of the mammalia in its form and structure; but the right ventricle, instead of a mere membranous valve, is furnished with a strong muscle, to impel the blood with greater force into the lungs. The lungs are small, and communicate with large air-cells (q.v.) in the cavities of the body, and even in the bones, so that the aëration of the blood takes place not only in the lungs but during its circulation through the body. An extraordinary proof of the use of these air-cells in respiration was afforded in a recorded instance of a large sea-fowl, which, when an attempt was made to strangle it, was kept alive by the air entering in a forcible current through a broken wing-bone. (Gosse, *The Ocean*, quoting Bennett's *Whaling Voyage*.) B. consume much more oxygen in proportion to their size than quadrupeds.

BIRDS.

The organs of the senses are similar to those of mammalia. In the senses of touch and taste, it is generally supposed that there is an inferior development, although parrots appear to possess the sense of taste in considerable perfection; and the bills of some B., which search among the mud for their food, are certainly very delicate organs of touch. But the sight is remarkably keen, and the eye possesses great powers of accommodation to different distances. B. perceive even small objects distinctly, at distances at which they would be quite indistinguishable to the human eye, and thus are enabled to seek their food.

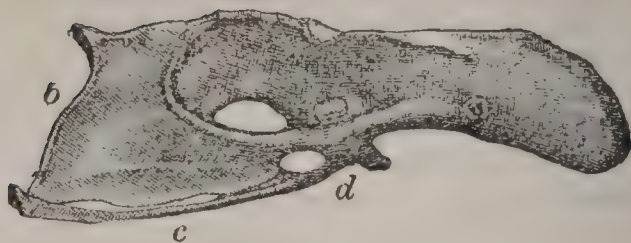


Digestive Organs of Domestic Pigeon.

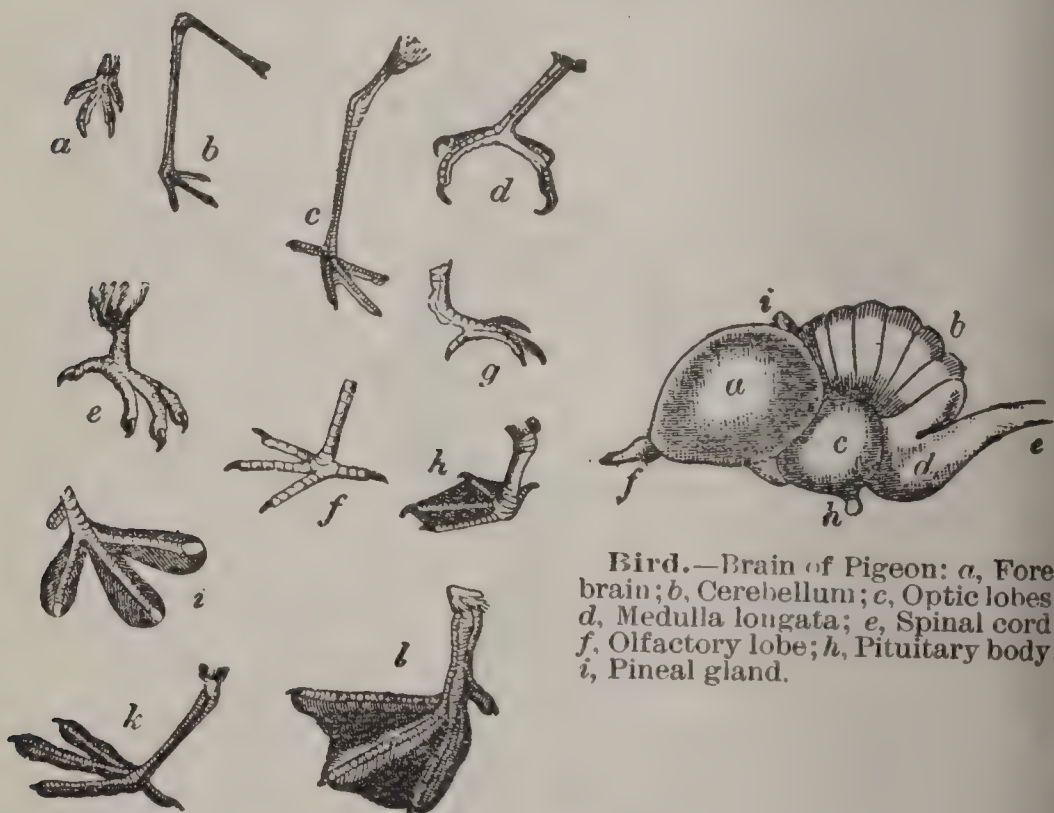
a, bill; *b*, head; *c*, esophagus; *de*, crop of extreme size; *f*, continuation of esophagus; *g*, proventriculus; *hijkl*, gizzard: *h*, upper muscle; *i, j*, lateral muscles; *k*, lower muscle; *l*, tendon; *mnopqr*, intestine; *s*, trachea.

B. of prey also appear to possess in great perfection the sense of smell. The nostrils of all B. open on the upper surface of the bill. Hearing is acute in B., and particularly in nocturnal B., although the organs of this sense are less complicated than in mammalia, and there is seldom any vestige of an external ear. Singing-B. are extremely sensitive to differences of pitch. The voice and musical powers depend upon the conformation of the windpipe and syrinx, which differs very much in different birds.

Reproduction takes place by eggs (see REPRODUCTION and Egg), hatched after they have passed from the body of the mother. B. generally sit upon their eggs, their



Bird.—Hip-girdle of Fowl: *a*, Ilium; *b*, Ischium; *c*, Pubis; *d*, Socket.



Bird.—Brain of Pigeon: *a*, Fore-brain; *b*, Cerebellum; *c*, Optic lobes; *d*, Medulla longata; *e*, Spinal cord; *f*, Olfactory lobe; *h*, Pituitary body; *i*, Pineal gland.

Feet of various Birds: *a*, Swift; *b*, Stilt; *c*, Black stork; *d*, Wryneck; *e*, Falcon; *f*, Raven; *g*, Kingfisher; *h*, Pelican; *i*, Grebe; *k*, Coot; *l*, Smew-duck.



Bird.—Head of Falcon, showing beak, nostril, eye, and ear; opening exposed by removal of feathers.

BIRDS.

bodies supplying the warmth necessary to hatch them (see INCUBATION); and this office is usually undertaken by the female alone, but sometimes is shared by the male. In very warm climates, the ostrich leaves her eggs to be hatched by the heat of the sun, but in colder climates sits upon them. A very few B., as the cuckoo, deposit their eggs in the nests of other B., to be hatched by them. Some B. construct no nest, but lay their eggs on the bare rock, as many sea-fowl do, or in holes rudely scratched in the earth or sand; many, however, show in the construction of their nests the most admirable instincts. See NESTS. The number of eggs varies, in a state of nature, from 1 to about 20, being generally smallest in the larger B., and particularly in B. of prey. B. generally breed only once a year, but some B. twice. The care which B. take of their young is as admirable as the ingenuity which they display in nest-building, and more universal. Some B. are able to run about and pick up food as soon as they leave the shell; others remain in the nest for days, or even weeks, and must be supplied with food by their parents. Many species are social, particularly at the breeding season, and form large settlements, which they guard in common; and some even unite in the construction of large nests, which belong to a whole community. The rapacious B., and particularly the larger ones, are very solitary in their manner of life.

B. change their feathers (*moult*), in general, once a year, and the colors of the plumage in many cases vary much in summer and winter. The change of color, however, often takes place without change of feathers, and in B. which moult both in spring and autumn, the autumn moulting is much more complete than that of spring. The gayest plumage of many B. is assumed at the breeding-season, with which, also, the song of B. is connected. See SONG OF BIRDS. The plumage of the male is, in general more gay than that of the female, all the young at first resembling the female in plumage. The plumage usually characteristic of the male is occasionally assumed by the female, and most frequently by females which have become unfit for the ordinary functions of their sex.

The brain in B. differs in some important respects from that of mammalia (see BRAIN) presenting resemblances to the brain of reptiles and fishes; but it is of large size, often larger than even in quadrupeds. The manifestation of intelligence is not, however, usually so great in B. as in quadrupeds. Their nest-building, their migrations (see BIRDS OF PASSAGE), and many other things of greatest interest, must be ascribed to instinct.

In the geographical distribution of B., the limits of species are not so exactly circumscribed by mountains, seas, and rivers, as in other classes of animals, their powers of flight enabling them to pass over these obstacles. Yet some species, and even groups, are found exclusively in certain regions: thus humming-birds all are American, penguins are found only in the southern seas, and B. of paradise are confined to New Guinea and the neighboring islands. See SPECIES.

BIRDS.

The free movements of B. through seemingly boundless space, the joyous song of many, and the characteristic tones of all—their brilliant colors, their lively manners, and their wonderful instincts—have from the earliest ages made a strong impression on men's minds, and in the infancy of intellect gave rise to many peculiar and mysterious associations with this class of creatures. Hence the flight of B. was made the foundation of a particular art of divination. See AUGURIES AND AUSPICES. Religion borrowed many of its symbols from them, and poetry many of its ornaments.

In an economical point of view, B. are very important. The flesh and eggs of almost all B. may be eaten, although those of B. of prey and fish-eating B. are generally reckoned unpleasant. Their feathers are employed for various purposes of use and ornament; their dung is valuable for manure, and guano (q.v.) is nothing else than the accumulated dung of sea-fowls. Many B. are extremely useful in preventing the multiplication of insects and worms, and compensate in this way for the mischief which they occasionally do in fields and gardens. Domestic poultry are a source of profit. See POULTRY. Some kinds of B. of prey have been tamed, and trained to the use of the sportsman. See FALCONRY.

About 7–8,000 living species of B. are known. As to their systematic arrangement, see ORNITHOLOGY: ZOOLOGY.

The order of B. presents in the Dodo (q.v.) a remarkable and well-ascertained instance of a recent extinction of a species and even of a genus. It is also a remarkable and interesting fact, that the greater part of the remains of extinct B. hitherto discovered are those of land-B. destitute of the power of flight, like the dodo, and the stil. existing ostrich, cassowary, emu, and apteryx. A particular interest is attached to the remains of the gigantic *Dinornis* (q.v.) of New Zealand. See BIRDS, FOSSIL.

BIRDS, FOSSIL: remains of birds that are found in the rocks of the earth's crust. While the remains of extinct species of vegetables and animals cover a wider range than living species, yet several divisions are scantily represented in the stony records. This was to be expected from the conditions under which these fossiliferous strata were deposited. As these rocks are aqueous, chiefly marine, the relics of plants and animals whose natural habitats were in or near the water must be common in a fossil state, while the remains of others with different habits will be comparatively rare, if present at all. Birds belong to this latter class. Their power of flight would save them from numerous casualties which would prove fatal to quadrupeds; and even if they did perish in water, the lightness of their bodies, produced by their internal cavities and the quantity of their feathers, would keep them floating until they decomposed, or became the food of predaceous animals.

The earliest traces of B., doubtful are footprints on red argillaceous sandstones in the valley of the Connecticut river. These sandstones, though long considered to be

BIRDS.

much order date, have been, on the best evidence, referred by geologists to the Triassic, or Jura-trias. The beds had formed an ancient sea-beach, and over it, during the recession of the tide, had marched the animals, which have left on them their footsteps. Before the return of the tide, the inequalities had been filled up with dry air-drifted sand and mud, and on this was deposited a new layer of silt. The beds often exhibit ripple-marks, and occasionally small circular depressions, which have been formed by drops of rain. A large number of footprints, collected by Pres. Edward Hitchcock, of Amherst Coll., were named *Ornithichnites* [Gr. *ornis*, bird, and *ichnos*, track]; but the tendency of investigation has been to regard them as made by ornithic reptiles, the Dinosaurs, which had points of similarity to birds in their skeletal conformation, and had the habit of walking in a semi-erect attitude. Comparatively small fore-feet sometimes accompany the most bird-like tracks.



Bird-tracks in New Red Sandstone.

In one species, the imprint of the foot measures fifteen inches in length and ten inches in breadth, excluding the hind claw, which is two inches long. The distance of the impressions from each other varies from four to six feet. If a bird, the creature would be four or five times the size of an ostrich, and larger than the most gigantic species of *Dinornis*. The footprints are for the most part trifid, and show the same number of joints as exist in the living tridactylous birds.

A single bird has been discovered in the Jurassic of Wyoming (succeeding the Triassic of the Conn. valley), about the same period as *Archæopteryx*; like that, it had teeth and reptilian features. In the Cretaceous period following, about 20 fossil birds have been found, in Kan., Tex., and N. J.; so far as appears, they were wading birds and aquatic. The Tertiary beds of N. Amer. afford 25 or more distinct specimens, of various orders now existing. One bone from the chalk, regarded by

BIRD'S-EYE VIEW—BIRD'S FOOT TREFOIL.

Professor Owen as part of the humerus of a bird, is now believed to belong to a Pterodactyle.

No true fossil remains of B. were found before 1858 in rocks older than the Eocene-gypseous deposits of Montmartre, where ten species have been found. Seven species have been described from strata of the Miocene period, the most important of which have been found in the Scwalik beds, associated with the remains of huge proboscidea. But the Pleistocene deposits have supplied more than half of the known fossil birds. The most remarkable of these are the bones of huge struthious B. of the genera *Dinornis* (q.v.) *Palapteryx* (q.v.), and *Aptornis*; and the *Æpyornis*, from Madagascar. The recently classified toothed-birds of America are called by Marsh, *Odontornithes* (q.v.).

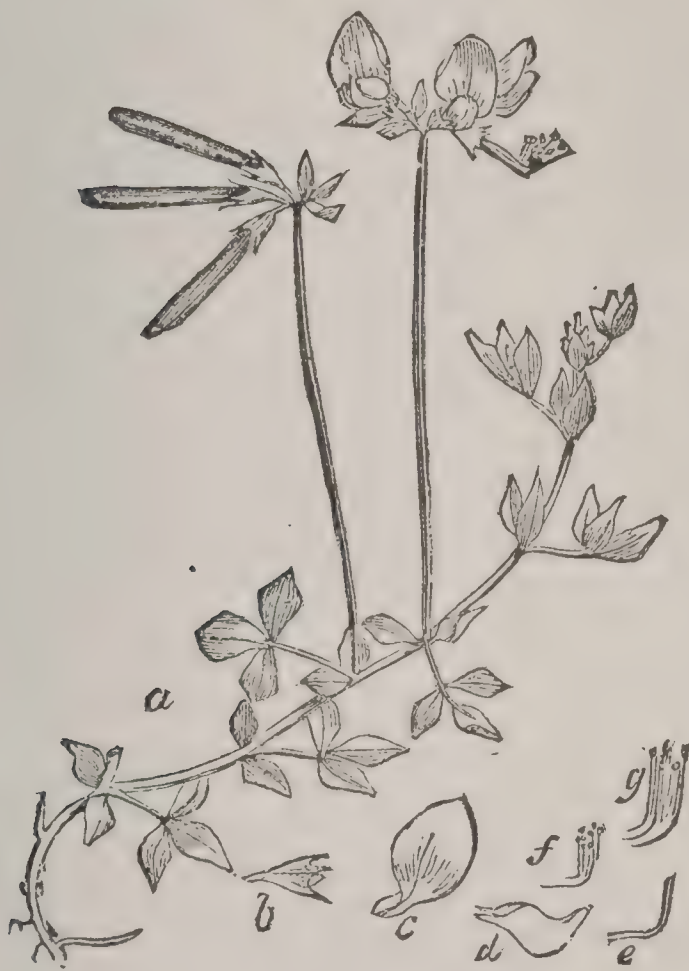
BIRD'S-EYE VIEW: term applied generally to modes of perspective in which the eye is supposed to look down upon the objects from a considerable height. If the eye is considered as looking perpendicularly down while it sweeps over each point of the scene in succession, we have an exact ground-plan; no object covers another, horizontal angles and distances are exactly represented; while, on the other hand, no vertical angles or side views appear. In sketching or drawing a locality for military or economical purposes, this kind of perspective is always used. The great difficulty is to represent at the same time the relative heights of mountains and steepness of acclivities. But the more usual kind of bird's-eye views differ from common perspective only in the horizontal line being placed considerably above the picture. In the 16th c., the only kind of views known were of the nature of ground-plans, and the artists of the 17th c. tried to combine this method with side-views.

BIRD'S FOOT (*Ornithopus*): genus of plants of nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, deriving both its popular and its botanical name from the resemblance of the curved pods to bird's claws; the leaves are pinnate, with a terminal leaflet. One species (*O. perpusillus*) is a native of Britain. *O. sativus*, an annual growing to the height of two or three ft., a native of Portugal, is cultivated in that country as green food for cattle, and is very succulent and nutritious. Like its British congener, it grows well on very poor soils. Its Portuguese name is *Serradilla*.

BIRD'S FOOT TREFOIL (*Lotus*): genus of plants of the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*. The pods are cylindrical, somewhat spongy within and imperfectly divided into many cells. The name bird's foot trefoil is derived from the resemblance of the clusters of pods to a bird's foot. It has received the name *Lotus* from botanists, because a species of this genus is supposed to have been one of the plants so named by the Greeks. See *Lotus*. The species, which are numerous, are natives of the temperate and colder regions of the old world. The **COMMON BIRD'S FOOT TREFOIL** (*L. corniculatus*) is abundant everywhere in

BIRD'S FOOT TREFOIL.

Britain in pastures. It has a stem 6-12 inches in length, decumbent, and bearing umbellate heads of 8-10 yellow flowers, which have a rich honey-like smell. The leaves have three obovate leaflets, like those of the true Trefoils or Clovers, but at the base of each leaf-stalk there are also two large leaf-like ovate stipules. The plant is by some regarded as the shamrock (q.v.) of Ireland. It is eaten with great avidity by cattle, and its deeply penetrating roots adapt it well for very dry situations.—A larger species, otherwise very similar, by many regarded as merely



Bird's Foot Trefoil (*Lotus corniculatus*).

a, a stem with leaves, flowers, and pods; *b*, calyx; *c*, standard of flower; *d*, keel of flower; *e*, style; *fg*, stamens.

a more luxuriant variety of this, with stem nearly erect, more compact heads of smaller flowers, and much smaller seeds, is the GREATER or NARROW-LEAVED BIRD'S FOOT TREFOIL (*L. major*) which also is a common native of Britain, generally found in moist, bushy places. The characteristic differences remain under cultivation in every variety of soil and situation.—A species called the Winged Pea (*L. tetragonolobus*), remarkable for four membranous wings which run along its pods, a native of the south of Europe, is in some places cultivated for its seeds, as a substitute for coffee.

BIRMAH—BIRMINGHAM.

amounted only to 236. The principal streets of B. are laid out with great regularity, crossing each other at right angles, and about 20 yards wide; but the back streets are narrow and the houses mean. Hamilton Square, a quadrangle of about 8 acres, is scarcely excelled by any buildings in the United Kingdom. The park is a splendid feature of B., consisting of 190 acres. A railway bridge over the Mersey at Runcorn, opened for traffic in 1869, shortened by 10 miles the distance between the Liverpool and Birkenhead docks; and the Mersey railway tunnel, 1,230 yards long, was opened by the Prince of Wales 1886, Jan. 20. It is to the docks chiefly that B. owes its rapid development and prosperity. The first were opened 1847; they now cover 496 acres, and are superb specimens of engineering skill.

B. has for some years been celebrated for its ship-building yards, some of the largest iron ships afloat having been built there by extensive firms. The too historical *Alabama* was built by the Messrs. Laird, to whose enterprise, more than that of any other company, the town owes its present eminence. In the neighborhood of the docks are the Canada Works for the construction of gigantic bridges, the Britannia Machinery Works, and others.

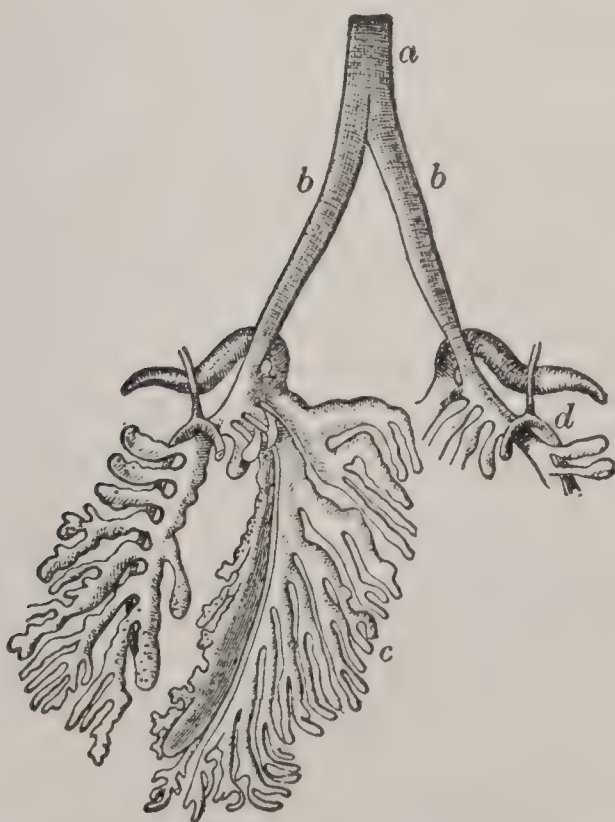
B. owes its origin to a Benedictine priory founded there in the 12th c., of which some remains are still seen. Edward II. granted the entire monopoly of the ferries to its monks. The remains of the monastery are still in a tolerable state of preservation, exhibiting some fine specimens of the English architecture of the period of its foundation. Pop. of B. parliamentary borough (1871) 65,971; (1881) 84,006; (1891) 99,184; (1901) 110,906.

BIR'MAH: see BURMAH.

BIR'MINGHAM: a city, county-seat of Jefferson co., Ala., about 25 m. w. of the Coosa river, on the South and North Alabama railroad where it crosses the Alabama and Chatanooga railroad, 95 m. n.n.w. of Montgomery. It is on a level plain between two ranges of hills, and is well laid out. On account of its marvellous growth since the last census it well deserves the name of 'magic city.' It owes its prosperity to the extent and richness of its coal and iron mines, the most valuable being in Jefferson co. and in Walker co., which adjoins it on the n.w. Its varied manufacturing interests, stimulated by northern capital, have made it one of the great commercial centres of the south. B. has 22 churches, 11 schools, a large water-works system, and a very complete and efficient sewerage system. Net debt (1901) \$2,124,000. In 1900 there were reported of various manufacturing industries, 283 establishments; employed \$7,434,654 capital and 6,675 hands; paid \$2,587,221 for wages, \$6,045,552 for materials, and \$533,368 for miscellaneous expenses; and received \$12,581,066 for products, \$5,461,358 of this being for iron and steel products, which employed 2,040 hands. The steel and iron works and machine shops in Birmingham are of the largest and best in the country, having become the successful



Beaks of various Birds: *a*, Marabou stork; *b*, Sparrow; *c*, Boatbill; *d*, Swordbill humming-bird; *e*, Species of thrush; *f*, Pelican; *g*, Spoonbill; *h*, Scissorbill; *i*, Flamingo; *j*, Avocet; *k*, Boatbill stork; *l*, Open-bill stork; *m*, Ibis; *n*, Condor; *o*, Merganser; *p*, *Columba ænas*; *q*, *Mycteria* or saddle stork.



Lungs of Bird: *a*, Base of trachea; *b,b*, Bronchial tubes; *c*, Branches of bronchi; *d*, Blood-vessel.

BIRMINGHAM.

rivals of those of Pennsylvania even, and have shipped some of their products to that great iron state. It has also a fine court-house, several newspaper offices, flouring-mills, and various other factories. Pop. (1890) 27,000; (1900) 38,415.

BIR'MINGHAM: formerly a town, New Haven co., Conn., 10 m. w. of New Haven, on the Housatonic at mouth of the Naugatuck river; on the Naugatuck and New Haven and Derby railroads; consolidated with the former town of Derby to form the city of Derby in 1894. It has churches, banks, a graded school, a newspaper office, an iron foundry, several rolling-mills, and other manufactories.

BIR'MINGHAM: chief town in Britain for metallic manufactures, and supplying much of the world with hardwares; near the centre of England, in the n.w. of Warwickshire, with suburbs extending into Staffordshire and Worcestershire, 112 m. n.w. of London. It is well drained; and contamination of the atmosphere by smoke is largely prevented. Among the finer buildings are the post-office, the corporation buildings, the town hall, the exchange, the rooms of the Royal Society of Artists. B. began very early to be the seat of iron manufactures, from its vicinity to a forest and extensive iron mines; but its industry and trade were long small. Its high commercial importance dates from the 17th c., when the restoration of Charles II. brought from France a fashionable rage for metal ornaments, and B. supplied the demand with unexampled vigor. From being the 'toyshop of Europe' of Burke's time, B. now constructs steam-engines, hydraulic-presses, and crystal palaces; and its hardwares are unequalled in the world for quantity, variety, and value. It produces upwards of £5,000,000 worth of goods yearly, chiefly articles of gold, silver, iron, brass, steel, mixed metal, plated metal, glass, papier-maché, japanned and electrotyped articles; including firearms, ammunition, swords, metal ornaments, toys, jewelry, buttons, buckles, lamps, pins, steel pens, tools, locks, bedsteads, saddlery, steam-engines, and all sorts of machinery. In B. 1,000 ounces of gold are made into chains weekly; at least 70 ounces of gold-leaf are used weekly; 30,000 gold rings are made yearly; 150,000 ounces of silver are used yearly; a billion of steel pens are made yearly, more the 500 tons of steel being used; above 80,000 copper coins are struck daily; 20,000,000 nails are made weekly at one work; 5,000,000 fire-arms were made 1804-18; and during the Crimean war the government was supplied from B. with 3,000 muskets weekly. The button manufacture of B. is very large. The steam engines in B. are estimated as equal to 10,000 horse-power, and consume 600 tons of coal daily. In B. above 20,000 families are engaged in trade, manufactures, and handicraft, B. has more than 170 places of worship, about 60 of the establishment; a grammar school; a queen's college; the admirably equipped science college, founded by Sir Josiah Mason 1880, occupying a handsome building in the heart of B.; a literary and scientific institute (the Midland Institute); a free

BIRNAM—BIRNEY.

library, with branches; a Rom. Cath. college and cathedral; a botanic garden; an art gallery; and four public parks. It is famed for its charitable institutions, and in B. was originated the system of annual collections for local charities. The town-hall can hold 6,000 persons, and has a magnificent organ, and a musical festival is held in it once every three years. Of the many ways of spelling the name of this city, the oldest is that given in *Doomsday Book*—namely, Bermingeham. This was corrupted into Brummagem, a name which has become synonymous with worthless wares with a glittering outside. B. took the Parliament side in 1643, supplying swords, and using them well against Prince Rupert and his lancers. In 1791, a B. mob denounced the distinguished Dr. Priestley as an atheist and Jacobin, destroyed his house, library, and apparatus, besides much other property; a statue has recently been erected to his memory. Near Handsworth, a little to the south of B., were the famous Soho Works, founded by Watt and Boulton, where steam engines were first made. Handsworth church has a statue of Watt by Chantrey, and a bust of Boulton by Flaxman. Willmore and Pye, the engravers, and David Cox, the landscape painter, were B. men. Thomas Attwood originated the Political Union here, which greatly hastened the passing of the Reform Act of 1832, and the enfranchisement of Birmingham. B. returns 7 members to Parliament. Pop. (1690) 4,000; (1801) 60,822; (1851) 232,841; (1871) 343,787; (1881) 400,774; (1891) 429,171; (1901) 522,182.

BIR'NAM: a hill 1,324 ft. high, in the e. of Perthshire, near Dunkeld, 12 m. n.w. of Perth, 12 m. w.n.w. of Dunsinnan hill, one of the Sidlaws. It commands a fine view of the valley of the Tay. It was formerly covered by part of an ancient royal forest. Shakespeare has immortalized B. wood in his tragedy of *Macbeth*.

BIRNEY, *bēr'ně*, **DAVID BELL:** military officer: 1825, May 29—1864, Oct. 18; b. Huntsville, Ala.; son of James G. B., anti-slavery agitator. He was educated at Phillips Acad., Andover, Mass.; and was in business in Philadelphia when the civil war began. He volunteered for three months, and afterward raised a regiment of which he became col., and passed through the Peninsular campaign with distinction, being promoted to brig.gen.; and to maj.gen. U. S. vols. 1863, May 23. Appointed to command the 10th army corps, 1864, July 23, he was with Gen. Grant in the Wilderness, where he caught the fever of which he died.

BIR'NEY, **JAMES GILLESPIE:** statesman: 1792, Feb. 4—1857, Nov. 25; b. Danville, Ky. He graduated at Princeton Coll., 1810, studied law in Philadelphia with A. J. Dallas, returned to Danville, where he began practice; was elected to the Ky. legislature 1816, and at once began the opposition to slavery which he continued during his life. He settled in Huntsville, Ala., 1818, became a member of the legislature, and afterward solicitor of the northern circuit of that state, besides being several times mayor of Huntsville. He returned to Kentucky 1833, and began

again to agitate against slavery, freed his own slaves 1834, formed the Kentucky Anti-Slavery Soc. 1835, and the same year removed to Cincinnati, O., on account of the excitement caused in Ky. by his reformatory views and acts. Here he established the *Philanthropist*, one of the first abolition papers, and began a propaganda in the north by delivering speeches and lectures in principal towns and cities. His newspaper office in Cincinnati was several times attacked by mobs, and his press destroyed. He was appointed sec. of the Amer. Anti-Slavery Soc. 1837, and removed to New York, where he soon became a power. In 1839 he emancipated 21 slaves which had come to him by inheritance. In 1840 and 44 he was nominated by the liberty party (precursor of the republican party) their candidate for the presidency, receiving (1840) 7,369 votes, (1844) 62,263. In 1842 B. settled at Bay City, Mich.; and, 1845, by a fall from a horse, was partially paralyzed, and disabled for public activity. B. was an able and eloquent public speaker, and skilled in debate. His manners were polished and dignified, and his life was singularly pure. He wrote numerous tracts and pamphlets against slavery.

BIRNEY, WILLIAM, lawyer: 1819, May 28—
—; b. near Huntsville, Ala.; son of James G. B. He studied at Centre Coll., Ky., and at Yale (graduating 1841); also in Berlin, Prussia; and became at Bourges prof. of Eng. literature in the Univ. of France 1849. Returning to the United States, he entered the Union army as capt. 1861, Apr., and was constantly in active service in Va. and elsewhere until 1863. His promotion was rapid, reaching the brevet rank of maj.gen. U. S. vols. He was engaged 1863-4 in organizing colored troops, and sent 7 full regts. to the front. He was appointed dist.atty. in Fla. 1872; settled in Washington as a lawyer 1874, and was atty. for the Dist. of Columbia 1874-78. He wrote *Life and Times of James G. Birney*; *Genesis of the Republican Party*, etc.

BIRNIE, bér'ně, ROGERS: military officer: 1851, Apr. 5—
—; b. Carroll co., Md. He graduated first in his class at the U. S. Milit. Acad. 1872; was transferred from the inf. to the ordnance dept. 1878; and was promoted capt. 1886. In the latter year he was assigned to the office of the chief of ordnance, Washington. B. has contributed largely to the development of the science of modern gun construction, and is an authority and voluminous writer on subjects relating to his branch of the service.

BIRON, bē'ron or BI'REN, ERNEST JOHN DE, Duke of Courland: 1687-1772, Dec. 28; son of a landed proprietor in Courland, of the name of Bühren. He studied at Königsberg, and in 1714 visited St. Petersburg, where his handsome person and cultivated mind soon gained him the favor of Anna Ivanovna, niece of Peter the Great. When Anna ascended the throne of Russia, 1730, Biron repaired to court, and was loaded with honor. He assumed the name and arms of the French dukes De Biron, and soon swayed all Russia through his royal mistress. Proud and despotic by nature, he hated every one who stood in the way of his ambition. The princes Dolgorucki and their

BIRRELL—BIRSE.

friends were his first victims. More than a thousand persons were put to death by his orders, and a still greater number sent into banishment. The empress is said to have often thrown herself at his feet to induce him to relent, but her prayers and tears were of no avail. It is, however, undeniable, that by the strength of his character he introduced vigor and power into every branch of the public administration throughout Russia. In the year 1722, he married a Courland lady, and in 1737, the Courlanders were compelled to choose him as their ducal ruler. By his desire the empress, on her death-bed, appointed him guardian and regent during the minority of her presumptive heir, Prince Ivan. On the death of the empress (1740, Oct. 28), Biron assumed the regency, and acted with great prudence and moderation. A secret conspiracy was, however, soon formed against him, and on the night of Nov. 19 he was arrested, by the orders of Field-marshal Münnich, and conveyed to the fortress of Schlüsselburg, where he was tried and sentenced to death. His sentence was afterwards commuted to imprisonment for life, and confiscation of his property. He was now, with his family, conveyed to Pelim, in Siberia. When, in the following year, Elizabeth ascended the throne of Russia, B. was recalled, and Münnich sent to occupy his prison in Siberia. The sledges met at Kasan; the two enemies looked at each other, but continued their journeys without exchanging a word. During the remainder of Elizabeth's reign, B. continued to reside with his family at Jaroslaw. The empress Catharine II. restored to him the Duchy of Courland.

BIRRELL, AUGUSTINE: an English author; b. 1850, Jan. 19; was graduated at Cambridge University 1872; called to the bar at the Inner Temple 1875; became a member of parliament 1879. He is known as the author of fascinating critical and biographical essays on literary subjects, in two series of *Obiter Dicta* and *Res Judicatae* (virtually the third of the same series). He also published *Men, Women, and Books*, a collection of short newspaper pieces; *Life of Charlotte Brontë*; and *Life of Sir Frank Lockwood*. In 1897 he edited Boswell's *Life of Johnson*.

BIRS: small but famous affluent of the Rhine; rises in the canton of Bern, Switzerland, near the pass of the Jura called Pierre Pertuis, flows n.e. through the Münsterthal, and enters the Rhine near Basel. In a narrow gorge through which the stream breaks, at a little distance from that city, 500 confederate Swiss died heroically, 1444, Aug. 26, in battle against the French army under the Dauphin Louis. On the same river, near the village of Dornbach, about a mile and a half s. of Basel, 6,000 confederate Swiss gained a splendid victory over 15,000 Austrians, under Fürstenberg, 1499, July 22; in consequence of which, the Emperor Maximilian signed a peace at Basel, Sep. 21 following.

BIRSE, n. *bérs* [Scot.]: in *OE.*, and *prov. Eng.*, bristle; one's temper or mettle.

BIRS NIMRUD—BIRU.

BIRS NIMRUD: see **BABEL**, **TOWER** of.

BIRT, n. *bért*: see **TURBOT**.

BIRTH, n. *berth* [AS. *beorth*; Sw. *bord*, a birth—from AS. *beran*, to bring forth: Icel. *burthr*, a birth]: the act of coming into life; the being born; descent; family; condition in which one is born; origin; beginning; the thing produced. **BIRTH-MARK**, permanent mark on the skin at birth (see **NÆVUS**). **BIRTHPLACE**, place where born. **BIRTH-RIGHT**, a right or privilege which any one is entitled to by birth. **BIRTHDAY**, the day on which a person is born; the anniversary of it. **BIRTHWORT**, n. *-wért*, a popular name for the *Aristolochiās*, from their supposed action on the uterus; a genus of plants, ord. *Aristolochiā cǣæ*.

BIRTH: the act of coming into life: it has important legal bearing in regard to the evidence of its legitimacy or illegitimacy. These qualities are variously determined by the regulations of different systems of jurisprudence. The ancient Roman law, as well as the modern Prussian and French codes, in particular, contain anxious provisions on the subject. In Eng. and Amer. law, no precise time is prescribed for fixing legitimacy or illegitimacy of birth. Forty weeks is considered, in practice, the more usual time for legitimate births; but a discretion to allow a longer time is exercised, when, in the opinion of medical men, or under the peculiar circumstances of the case, protracted gestation may be anticipated, or is likely to occur. See **BASTARDY**: **HEIR**: **INHERITANCE**. To make complete the B. of a living person, the whole body must be brought forth, and detached from the mother, after which there must be life in the child, and independent circulation. The killing of a living child before B. is thus complete is murder, unless for the saving of the mother's life.

BIRTH, CONCEALMENT OF: an offense against the public economy, and punishable as a crime by the laws of most of the states. See **PREGNANCY, CONCEALMENT OF**.

BIRTHRIGHT: see **INHERITANCE**: **PRIMOGENITURE**.


BIRTHS, REGISTRATION OF, and of MARRIAGES and DEATHS: now regulated by law in many of the states, but with varying completeness and efficiency. The general form for registration of births comprises the time of birth, name, sex, and color (white or negro) of the child; the name, surname, maiden surname, etc., of the parents: this form must be filed with the proper official, by the physician or midwife in attendance. Similarly, the minister or other officiant at a marriage must file report of the place and time and of the name, age, nativity, occupation, etc., of the parties married. There are penalties for neglect. The details differ in different states.

BIRTHS, DEATHS, AND MARRIAGES: see **VITAL STATISTICS**.

BIRTHWORT: see **ARISTOLOCHIA**.

BIRU, BEEROO, or BEROO, *bē-ró'*: a kingdom of Sudan, w. Africa: lat. 15°–16° n., long. 5° 30'–7° 15' w.; bounded on

the n. by the Sahara, on the e. by the Niger, and has Bambarra on the s. Its w. limits are not clearly defined. The cap. town, Walet, is about 260 m. w.s.w. from Timbuctu.

BIS, in Music: denotes that the passage over which it is placed is to be played twice, or repeated. Such passages generally have a slur or bow over them, and the word 'bis' written below it, thus .

BISACCATE, a. *bī-sāk'kāt* [L. *bis*, twice; *saccus*, a sack]: in *bot.*, having two little sacks or pouches.

BISACCIA, *be-sāt'chā*: town of the Italian province of Avellino, on a hill about 30 m. e.n.e. of Avellino. Numerous ancient remains discovered here appear to fix B. as the site of the old *Romulea*, captured by the Romans in the third Samnite war. Pop. (1887) 6,491.

BISACQUINO, *be-sāk-kwē'no*, or BUSACCHINO, *bō sāk-kē'no*: town of Sicily, about 27 m. s. of Palermo, with a population of 9,120, who carry on an extensive trade in grain and oil.

BIS'CAY, or VIZCAYA, *vēs-kī'á* or *vēth-kī'á*: most northerly of the Basque Provinces (q.v.); bounded n. by the Bay of Biscay; e. and s. by its sister-provinces, Guipuzcoa and Alava; and w. by Santander; 849 sq. m. Pop. (1877) 189,954; (1887) 235,659.

BIS'CAY, BAY OF: that portion of the Atlantic Ocean which sweeps in along the n. shores of the Spanish peninsula in an almost straight line from Cape Ortegal to St. Jean de Luz, at the w. foot of the Pyrenees, and thence curves n. along the w. shores of France to the island of Ouessant. Its extreme width is about 400 m., and its length about the same. The depth of water varies from 20 to 200 fathoms, being greatest along the n. shores of Spain. The whole of the s. coast is bold and rocky, in some places rising to a height of several hundred ft., and interspersed with short inlets, some of which form safe and commodious harbors. From the mouth of the Adour to the Gironde, the shore presents a totally different aspect, being low and sandy, with numerous lagoons, the embouchures of these two rivers forming the only harbors. For 200 m. n. the coast is still low, but marshy instead of sandy; and from the peninsula of Quiberon northward to Ouessant, it is moderately elevated and rocky in some places, with several good harbors. The rivers falling into the Bay of Biscay on the Spanish shores are unimportant, none of them having a course of more than 30 or 40 m. On the coast of France, it receives, through the rivers Loire, Charente, Gironde, and Adour, the waters of half the surface of the whole country. Its chief ports are Gihon, Santander, Bilbao, San Sebastian, and Passages, in Spain; and Bayonne, Bordeaux, Rochefort, La Rochelle, and Nantes, in France. Its chief islands—all situated n. of the Gironde—are Belle-isle, Ré, and Oléron. Navigation is rendered difficult and dangerous by the prevalence of n.w. winds (which drive in through the wide mouth of the bay large volumes of water from the Atlantic, to be again thrown back from the

long regular line of coast towards the centre, thus causing great commotion, and high, short, broken waves), and by the existence of a current—called Rennel's Current—which sweeps in from the ocean round the n. coast of Spain, along the w. and n.w. coasts of France, then shooting across the British Channel, brushes the Scilly Isles, and after approaching the coast of Ireland, turns w. and s., till it joins the n. African current.

BISCAYAN, a. *bis-kā'an* [from *Biscay*]: pertaining to the Spanish province, Biscay.

BISCEGLIE, *be-shēl'yá* or *be-shāl'yá*: seaport town of Italy, on the Adriatic, province of Bari, in the former kingdom of Naples; 21 m. n.w. by w. from Bari. It is built on a rocky promontory, defended by strong fortifications. The port admits only vessels of small burden. B. is a bishop's seat, and has a cathedral, besides two collegiate and several other churches, convents, a seminary, a hospital, etc. Rain-water is collected in public reservoirs, the water-supply being otherwise very insufficient. Around the town are many fine villas and country houses. The neighborhood produces good wine, and has acquired particular celebrity for its currants, which are said to be equal to those of the Ionian Islands. During the Crusades, B. was famous for its hospital, founded by Bohemond, for pilgrims from the Holy Land, of which some ruins remain. Pop. (1881) 21,675; (1887) 25,127.

BISCHOF, *bish'off*, KARL GUSTAV: 1792–1870; b. Nürnberg: chemist and geologist. He became prof. of chemistry in Bonn, 1822. Having obtained the prize of the Scientific Soc. of Holland for his treatise on Internal Terrestrial Heat, he published in England, in connection with it, *Researches on the Internal Heat of the Globe* (Lond. 1841), which was followed by a number of papers on connected geological subjects. The results of his researches (1837–40) on inflammable gases in coal-mines, and on safety-lamps, appeared in the *Edinburgh New Philosophical Journal* and other periodicals. His chief work is his *Manual of Chemical and Physical Geology*. He died at Bonn.

BISCHOFF, *bish'off*, THEODORE LUDWIG WILHELM: 1807–82, Dec. 5; b. Hanover, Germany: anatomist and physiologist. He became prof. of anatomy in Heidelberg, 1836. From Heidelberg he removed, 1843, to the Univ. of Giessen, and 1854, to that of Munich. B. greatly promoted the science of embryology, which he made his life's study. His *Entwicklungsgeschichte des Kanincheneies* (1843) received the prize from the Berlin Acad. Of his numerous writings in Müller's *Archiv*, and published separately, may be singled out the *Beweis der von der Begattung unabhängigen periodischen Reifung und Loslösung der Eier der Säugethiere und der Menschen* (Giess. 1844), in which he establishes the important doctrine of the periodic ripening and detachment of the ova in mammalia and man, independently of generation. He demonstrated the impossibility of spontaneous generation, and discussed the development, from the egg of various animals. Other works are on the differences

BISCHWEILER—BISCUITS.

in the formation of the skull in the chimpanzee, gorilla, and orang-outang (1867); *Die Grosshirnwindungen des Menschen* (1868); and *Beiträge zur Anatomie des Hylobates Leuciscus* (1870). B. was ennobled in 1871.

BISCHWEILER, *bish'vî-lér*: German town, on the Moder, about 14 m. n. of Strasburg. B. was formerly fortified, but was dismantled 1706. It has manufactures of earthenwares, coarse woolens, linens, and gloves, and a trade in beer, leather, and the agricultural produce of the district. Pop. (1880) 6,827; (1885) 6,810; (1891) 7,025.

BISCOTIN, n. *bîs'kôt-in* [F. *biscotin*]: sweet biscuit; a confection made of flour, sugar, marmalade, and eggs.

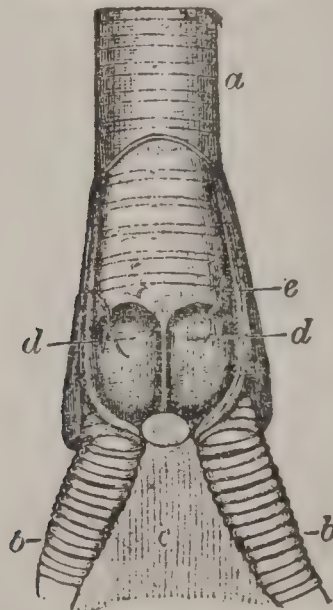
BISCUIT, *bis-kî't* [F. *biscuit*—from L. *bis*, twice; F. *cuit*, done or baked—from L. *coctus*, cooked or dressed]: bread baked hard for keeping (see **BISCUITS**); porcelain and other earthenware after the first firing, and before it has received the glaze and embellishments. See **PORCELAIN** and **POTTERY**. In this condition, the ware is very porous, adheres to the tongue when placed upon it, and allows water very slowly to percolate through its pores. The unglazed bottles employed in cooling water are examples of *Biscuit-ware*.

BIS'CUIT, MEAT: a preparation of the substance of meat combined with a certain quantity of flour, made into the form of biscuits, by which process the nutritive qualities of the meat are preserved for any length of time. One way of preparing these biscuits is as follows: Large pieces of beef are placed in a quantity of water sufficient to cover them, and are subjected to slow ebullition. The fat being skimmed off, evaporation is allowed to take place, until the liquid is about the consistency of syrup, when it is mixed with fine wheaten flour, rolled out to the thickness of ordinary ship-biscuit, cut into any shape required, baked, and dried in the ordinary manner. One pound of biscuit usually contains the soluble part of five pounds of meat, and half a pound of flour. The meat-biscuits can be eaten like ordinary biscuits; but boiled in about twenty times their own weight of water for half an hour, with the usual condiments, they make excellent soup, and for this chiefly they were intended. Meat-biscuits were introduced into Britain from America by Gail Borden 1851. One of the purposes which they were intended to serve—that of preserving the animal food of South America and Australia—has since been more effectually done by other means: see **PRESERVED PROVISIONS**; **PEMMICAN**.

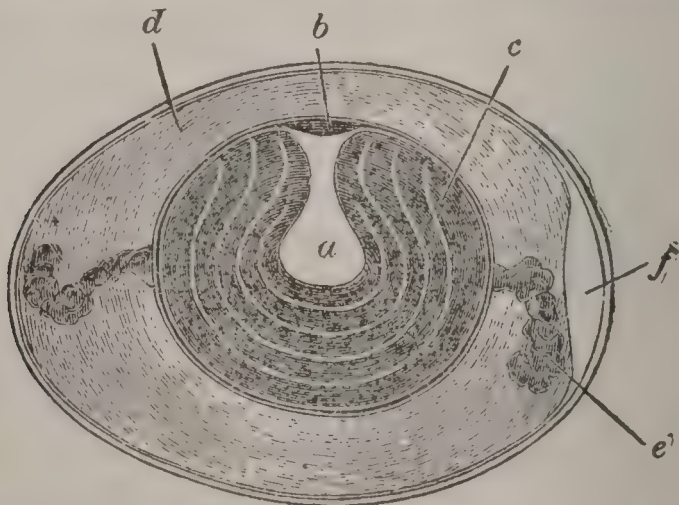
BIS'CUITS [Fr twice-baked], known in the United States as **CRACKERS** ('Biscuit' in this country meaning cakes of soft raised bread): small, flat bread, rendered dry and hard by baking, in order to their long preservation. They are divided into two classes—*unfermented* and *fermented*. *Unfermented* or *unleavened* B., generally known as *common sea-biscuit* or *ship-bread*, are made of wheaten flour (retaining some of the bran), water, and common salt. The materials are kneaded together either by manual labor, or as now almost universally by aid of machin-



Bird.—Wing of Pigeon, showing primary (*a*) and secondary (*b*) feathers, and 'bastard wing' (*c*) at thumb.



Bird.—Syrinx of Thrush: *a*, Trachea (open below); *b*, Bronchi (with wings); *c*, Internal tympaniform membrane; *d*, Muscles; *e*, Nerve supplying muscles.



Bird.—Section of Fowl's Egg: *a*, Central plug of white yolk; *b*, Position of germinal area; *c*, Yellow yolk; *d*, White of egg; *e*, 'Tread' or chalaza; *f*, Air-space between outer membranes.

ery—by introducing the materials into a long trough or box, with a central shaft, to which a series of knives is attached, and which is made to revolve rapidly by machinery. The mass of dough so obtained is then kneaded and thinned out into a sheet the proper thickness of the B., by being passed and repassed between heavy rollers. This sheet being placed below a roller with knife-edge shapes, is readily cut into hexagonal (six-sided) or round pieces of dough of the required size of the biscuits. The indentation of the slabs of dough, in the case of the hexagonal B., is not complete, so that all the B. cut out of each slab remain slightly adhering together. These slabs of B. are then introduced into an oven for about 15 minutes, and are placed in a warm room for two or three days, to become thoroughly dry. The more modern oven is open at both ends, and the B., being placed in a framework, are drawn by chains through the oven. So rapidly is this operation conducted, that about 2,000 lbs. weight of B. are passed through one of these ovens every day of ten hours.

Captains' B. are prepared from wheaten-flour, water, with common salt, and butter, with an occasional small dose of yeast to cause partial fermentation. Milk is also sometimes employed. *Water or hard B.* are made of flour, water, with variable quantities of butter, eggs, spices, and sugar. *Soft B.* contain increased quantities of butter and sugar. *Yeast B.* are those the dough of which is mixed with a small quantity of yeast, yielding more porous biscuits. *Buttered B.* are made with much butter and a little yeast. Numerous other varieties of B. (crackers in the United States) are produced by variations in the materials or in the process of baking.

BISCUTATE, a. *bī-skū'tāt*: in *bot.*, resembling two bucklers placed side by side.

BISE, n. *bēz* [F.]: a cold north wind which prevails on the northern coasts of the Mediterranean (see MISTRAL); the cold mountain-wind of the Alps.

BISECT, v. *bī-sēkt'* [L. *bis*, twice; *sectus*, cut]: to cut or divide into two equal parts. BISECT'ING, imp. BISECT'ED, pp. BISECT'ION, n. *-sēk'shūn*, the act of cutting into two equal parts. BISECT'MENT, n. the exact half of a line.

BISEGL'IE: see BISCEGLIE.

BI-SEPTATE, a. *bī-sēp'tāt* [L. *bis*, twice; *septum*, a fence, an inclosure]: having two partitions.

BISERIAL, a. *bī-sē'rī-āl* [L. *bis*, twice; *seriēs*, an order or row]: arranged in a double series or in two rows.

BI-SERRATE, a. *bī-sēr'rāt* [L. *bis*, twice; *serra*, a saw]: being doubly marked or notched like the teeth of a saw, as in certain leaves; having notches which themselves bear smaller notches.

BI-SEXUAL, a. *bī-sēks'ū-āl* [L. *bis*, twice; *sexus*, male or female]: of both sexes; hermaphrodite.

BISHOP.

BISHOP, n. *bīsh'ōp* [AS. *bisceop*—from L. *episcōpus*; Gr. *episkōpos*, an overseer]: a prelate; a clergyman consecrated for the government and oversight of the clergy within a district called a diocese. **BISH'OPRIC**, n. *-rīk*, or **BISH'OPDOM**, a diocese; the office and jurisdiction of a bishop. **BISHOP'S-WEED**, or **GOUT-WEED**, the *Ægopōd'ium podagrā-rīā*, ord. *Umbellif' ēræ*.

BISH'OP: title of the highest order of clergy in the Christian Church. The name is, in the Saxon, *biscop*, and is from the Greek *episcopos*, an overseer. The Athenians used to send officers called *episcopoi* to their subject states. The word was adopted by the Romans: and Cicero speaks of himself as an *episcopus* in Campania; it was also applied by them to the officers who inspected the provision markets. There are three theories as to the functions of a B. in the primitive church, which may be described as the Prelatical, the Presbyterial, and the Congregational theories. The last two, though showing differences fundamental in some particulars, may be considered as one in the denial that a B. in the Apostolic Church was, or of right now should be, of a distinct order of clergy, higher than the local pastor in a town or municipality. The last theory, however, involves no necessary denial of an assignment of certain pastors to special functions among their brethren, as expediency may require.

According to the Prelatical theory, the first bishops in the Church of Christ were his apostles; 'for the office whereunto Matthias was chosen is termed (Acts i. 20) *episcopo*—i.e., an episcopal office, which being spoken expressly of one, agreeth no less unto them all; and therefore St. Cyprian, speaking generally of them all, calls them *bishops*.' The form of government at first established by the apostles was, that the laity or people should be subject to a college of ecclesiastical persons appointed for that purpose in every city. These, in their writings, they term sometimes 'presbyters,' sometimes 'bishops.' Thus St. Paul to the elders at Ephesus says: 'Take heed to the flock over which the Holy Ghost hath made you *overseers*'—i.e., bishops. This explains the Congregational and Presb. view. But as the apostles could not themselves be present in all churches, and as in a short time strifes and contentions arose, they appointed, after the order began at Jerusalem, some one president or governor over the rest; who had his authority established a long time before that settled difference of name took place whereby such alone were called bishops; and therefore, in the book of Revelation, we find that they are entitled 'angels.' St. Irenæus, martyred in the 2d c., says: 'We are able to number up them who by the apostles were made bishops.' In Rome, he tells us, they appointed Linus; and in Smyrna, Polycarp. St. Ignatius witnesses that they made Evodius B. of Antioch. St. Jerome says: 'All bishops are the apostles' successors;' and St. Cyprian terms bishops '*prepositos qui apostolis vicaria ordinatione succedunt*' (presidents who succeed to the apostles by vicarious ordination). Hooker says, in his usual

judicious manner: 'Such as deny apostles to have any successors at all in the office of their apostleship, may hold that opinion without contradiction to this of ours, if they will explain themselves in declaring what truly and properly apostleship is. In some things, every presbyter, in some things only bishops, in some things neither the one nor the other, are the apostles' successors.' And he adds, what fairly states the Episcopal theory on this subject: 'The apostles have now their true successors, if not in the largeness, surely in the kind, of that episcopal function whereby they had power to sit as spiritual ordinary judges, both over laity and over clergy, where churches Christian were established.' We find, also, that throughout those cities where the apostles did plant Christianity, history has noted a succession of pastors in the seat of *one*, not of many; and the first one in every rank we find to have been, if not some apostle, yet some apostle's disciple. By Epiphanius, the bishops of Jerusalem are reckoned down from St. James to his own time; and Tertullian, writing in the 2d c., has the following: 'Let them show the beginnings of their churches, let them recite their bishops one by one, each in such sort succeeding other that the first B. of them have had for his author and predecessor some apostle, or at least some apostolical person who persevered with the apostles; for so apostolical churches are wont to bring forth the evidence of their estates.' The judgment of the Church of England as to the primitive existence of bishops is to be found in the preface to the ordination service, drawn up in the reign of Edward V., where it is said: 'It is evident unto all men diligently reading the Holy Scripture and ancient authors, that from the apostles' time there have been these orders of ministers in Christ's church—bishops, priests, and deacons.'

According to the other, the Presbyterian or the Congregational theory of bishops, the origin and general history of the institution are thus sketched. In the earliest churches, no traces of a hierarchy, it is affirmed, are to be found. The superintendents or directors appointed over the first churches by the apostles, or chosen by the members of the congregations, were unquestionably styled indifferently presbyters or bishops—the former title being borrowed from the Jewish synagogue, the superintendent or director of which was called the Elder (Gr. *presbyter*); the latter (*episcopus*) being familiar to the heathen converts as the title of a civil office corresponding in function to that of a Christian pastor. But this original equality did not last long. As new churches multiplied, those formed round the original church, though each having its own bishop or presbyter remained in confederacy; and in the meetings of the pastors to regulate the common affairs, one must of necessity preside, most likely determined by age, superior piety, prominent station, or other qualification. From this simple circumstance, as is indicated by Clemens Alexandrinus in the beginning of the 3d c., sprang the habit of looking upon one of the bishops as superior to the

BISHOP.

others; and this superiority, at first personal and accidental, soon became naturally to be regarded as attached to the B. of a particular congregation. In his case the word B. came to signify an overseer of pastors rather than an overseer of people. The monarchical form of state government favored this tendency, and converted the president of a presbytery into the privileged superintendent of his brother-pastors. The assumption was resisted by the presbyters at first, but from the middle of the 5th c., Episcopacy, or the domination of bishops, continued to gain against Presbyterianism (and against what little remained of Congregationalism), or equality of all pastors.

In the 3d c. bishops appear still dependent on the advice of their presbyters, and the consent of the people, and shared with the former the office of teaching and the cure of souls. As yet their exclusive privileges or functions were limited to confirmation, ordination of ministers, consecration of sacred things, settlement of secular differences among Christians, and management of the revenues of the church. But the tendency to subordination and unity did not rest here. Among the bishops, at first all equal, those of the larger and more important cities began gradually to acquire a superiority over those of inferior cities. When Christianity was made the religion of the Roman empire, the bishops became more and more monarchical, and put themselves on the footing of ecclesiastical princes. The chief cities of the larger civil provinces rose to be seats of extensive dioceses, the bishops of these assuming the distinctive titles of *patriarch*, *metropolitan*, *papa*—titles of courtesy that had long been applied to all bishops; while the less important provinces, with their capitals and bishops, became subordinate. Among these provincial bishops, again, three, from obvious causes, acquired a prominence that cast all the rest into the background—namely, Alexandria, Constantinople, and Rome. The beginnings of the ascendancy of the Roman B. are discernible as early as the end of the 2d c. While ancient Rome sought her secular dominion more in the south and east, modern ecclesiastical Rome turned herself chiefly to the nations of the west and north; and round the B. of Rome has grown a power—the Roman Catholic Church—not less important than that of imperial Rome.

In the Roman Catholic Church the episcopal office is the foundation of the whole system. Christ's apostles are held to have transferred their functions to the episcopacy as a body. Every B., therefore, exercises within his own diocese, first, the *jus magisterii*—i.e., the right of maintaining and propagating the orthodox faith; and second, the *jus ordinis*, or regulation of the sacred and mysterious rites of the priestly office, some of which are transferred to the inferior clergy, as *jura communia*, while others remain the privileges of the bishop (*jura propria*). Among episcopal prerogatives, in addition to those already mentioned as assigned to them in the 3d and 4th c., are anointing of kings, consecration of abbots, preparation of the chrism, etc. They have also the management of the

BISHOP.

church-property in their respective dioceses, and the oversight of all ecclesiastical institutions. Election to the office of B. rests generally with the presbyters of the diocese assembled in chapter, with the sanction of the secular power and of the pope. This is the case in Prussia. Where the sovereign is a Catholic, the appointment is mostly made by him, but subject to papal approbation. At consecration, which requires the presence of three bishops, the new B. takes an oath to the sovereign and to the pope, and signs the articles of belief, on which he receives the episcopal insignia—the mitre (q.v.); the crosier (q.v.), or staff; a gold ring, emblematic of his marriage to the church; the cross upon the breast; the dalmatica (q.v.), tunic, pallium (q.v.), and peculiar gloves and chaussure; and being enthroned as formal installation into office, he then pronounces the blessing on the assembled people. In the discharge of his office, the B. has a number of subordinate assistants; sometimes, in case of age or weakness, a coadjutor, but ordinarily deans, archdeacons, etc. (q.v.).

In the Greek church, the office of B. is essentially the same, though less influential. Greek bishops, however, are always chosen from the monkish orders, and generally from the archimandrites—i.e., abbots or priors.

As Protestantism met with its chief resistance from the bishops, and, besides, laid the chief stress on doctrine rather than on church order, the episcopal order, in most of the reformed churches, either disappeared or sank into comparative insignificance. Of the continental Protestant churches, episcopacy has kept the foremost hold in Sweden and Norway. The Scandinavian bishops acceded to the reformation in 1531 only on compulsion from Gustavus Vasa, who confirmed them in their revenues and prerogatives. The B. of Upsala is primate, and has the prerogative of crowning the king, consecrating the other bishops, etc. The bishops are named by the king out of three proposed by the chapters. They preside in consistories, hold synods, visit the churches, examine and ordain ministers, consecrate churches, and watch over purity of doctrine and the property of the church. They have seats in parliament, and wear the pallium, mitre, crosier, and cross. There are only six bishops in Sweden and Norway, with an additional B. of the order of the Seraphim.

In Denmark, the Roman Catholic bishops opposed the reformation, and were (1536) deposed by Christian III., and their extensive possessions confiscated. The king appointed in their stead a general superintendent and nine Protestant bishops, with a fixed stipend. They are under the secular government, and have very limited authority over the clergy under their charge. The first in rank is the B. of Seeland.

In Protestant Germany, the episcopal dignity and rights passed into the hands of the secular sovereigns, who, down to quite recent times, assumed the title of supreme bishops, and exercised the prerogatives of such. Where the sovereign, as in Saxony, was of a different confession from the majority of his subjects, the episcopal authority

BISHOP.

was delegated to a minister. The bishoprics, however, were gradually secularized, and with the nominal or titular bishops of Osnabrück and Lubeck (1803) the old episcopal dignities became almost extinct on the Protestant soil of Germany. The Lutheran Church, however, never formally abolished the office of B., and Melancthon endeavored to get it expressly recognized. In Prussia, accordingly, the title of B. has had a fluctuating fate. The bishops in office at the time having acceded to the reformation in 1525, were continued; but in 1554 the revenues were confiscated, and the duties assigned to superintendents. In 1587, this last remnant of the episcopal office also disappeared; till Frederick I. conferred the title of B. on two of his court-preachers on occasion of his coronation. At their death it again ceased, and was not revived until at the peace-festival in 1816 Frederick-William III. raised two clergymen to the dignity of bishops. One of them, the B. of Königsberg, received in 1829 the title of Evangelical Archbishop. Several have since received the title of B. along with that of superintendent-general, entitling them to the first place in the consistories, a certain civil rank, insignia, and salary. Of the other German states, only Nassau followed the example of Prussia, by naming in 1818 a B. for the united evangelical churches of the duchy. Elsewhere, the episcopal authority, mostly in very limited form, is exercised by consistories, ministries of worship, superintendents-general, inspectors, etc.

In the Church of Scotland, and other Presbyterian churches on the Geneva model, likewise in Congregational churches, the episcopal office is not recognized as applicable beyond the limits of a single parish—each pastor being declared to be, in the New Testament sense, bishop of his church.

In none of the Protestant countries have the prerogatives and revenues of bishops remained so little impaired as in England, where the reformation was taken by the king into his own hands, and being propagated from above downwards, was effected in a very conservative spirit. Episcopacy was abolished about the time of the Commonwealth, but at the restoration the bishops were restored, and have since retained their position in church and state.

The practice and history of the Church of England in the matter of bishops may be given somewhat more in detail. The B. is the head of the clergy in his diocese; he ordains them, whereby he calls them into existence as ecclesiastical persons; he institutes them to benefices, and licenses them to cures, and to preach; visits them, and superintends their morals; and enforces discipline, for which purpose he has several courts under him, and can suspend or deprive them for due cause.

Over the laity he exercises a general pastoral authority, but they are more particularly brought under his notice at the time of their confirmation. The style, title, and privileges of the B. are inferior to those of the archbishop (q.v.). He is said to be *installed* in his bishopric; he writes himself,

BISHOP.

By Divine Permission; and has the title of Lord, and Right Rev. Father in God; and he may retain six chaplains. A bishop must be at least 30 years of age; the reason for which is, that Christ began his ministry at that age. For many centuries after the Christian era, the B. received all the profits of his diocese, and paid salaries to such as officiated under him. The mode of election, confirmation, and consecration is the same in the case of bishops and archbishops, for each archbishop is also B., and has his own diocese. The B. is elected by the chapter of his cathedral church by virtue of license from the crown. The laity used to take part in the election, but, from the tumults that arose, the different sovereigns of Europe took the appointment, in some degree, into their own hands by reserving to themselves the right of confirming these elections, and of granting investiture to the temporalities which now began to be annexed to these dignities. This right was acknowledged in the emperor Charlemagne by Pope Hadrian I., 773, and the Council of Lateran. The right of appointing to bishoprics is said to have been in the crown of England even in Saxon times. But when, by length of time, the custom of electing by the clergy only was fully established, the popes began to object to the usual method of granting these investitures, which was *per annulum et baculum*—i.e., by the prince delivering to the prelate a ring and pastoral staff or crosier. In the 11th c., Pope Gregory VII. published a bull of excommunication against all princes who should dare to confer investitures. There were long and eager contests occasioned by this papal claim, but at length the matter was compromised, the emperor Henry V. agreeing to confer investiture for the future, *per sceptrum*; and the kings of France and England consented to receive only the homage for the temporalities, instead of investing them by the ring and crosier, the pope keeping in his hands the power of confirmation and consecration. This concession was obtained from Henry I.; but King John, in order to obtain the pope's protection against his barons, gave up, by a charter to all monasteries and cathedrals, the free right of electing their prelates. This grant was confirmed in Magna Charta, and was again confirmed by statute 25 Edward III. But by statute 25 Henry VIII., the ancient right of nomination was in effect restored to the crown. The sovereign, on the vacancy being notified, sends to the dean and chapter a letter missive, or *congé d'élire*, containing the name of the person to be elected; and if they do not elect in the manner appointed by the act, or if the archbishop or B. appointed for the purpose refuse to confirm, invest, and consecrate the B. elect, the recusants incur the penalty of a *præmunire* (q.v.). A bishop is not consecrated more than once, and he cannot be *deposed*, as it is supposed that the order itself cannot absolutely be taken from him; he may, however, be *deprived*, as was done to the B. of Clogher in 1822; he may also resign his see; and he may be removed from one see to another, which is called *translation*; but this practice is now less frequent than it used to be. The dean and chapter of Canterbury claim it as an ancient right of that church,

BISHOP.

that every B. of the province is to be consecrated in it, or the archbishop to receive from them a license to consecrate elsewhere; and it is said that a long succession of licenses to that purpose are regularly entered in the registry of that church. When elected and confirmed, a B. may exercise all spiritual jurisdiction, but he is not completely B. until consecration. Bishops, upon their election, become peers of the realm, and are summoned to the parliament as well as the other nobles; but the right under which they sit there, whether in respect of their baronies, or by usage and custom, is a matter of uncertainty. It appears, however, that the bishops sat in the Wittenagemote, under the Saxon monarchs, as spiritual persons; for they were not barons until William the Conqueror turned their possessions into baronies, and subjected them to the tenure of knights' service. The bishops created by Henry VIII.—viz, Gloucester and Bristol, Chester, Oxford, and Peterborough—as also the bishops of the lately-created sees, have seats in parliament, though they do not hold their lands by baronial tenure. The bishops withdraw from the house (under protest, however) when any capital charge is to be decided. The bishops sit in parliament next to the Archbishop of York; first, London; second, Durham; third, Winchester; and then the rest according to their ancienties. In respect of their persons, bishops are not peers with the nobility; and in cases of alleged crimes, they are tried by a jury in the same manner as commoners, as was the case with Cranmer and Fisher. When a see is vacant, the archbishop of the province is guardian of the spiritualities; but he cannot as such consecrate or ordain or present to vacant benefices. The sovereign has custody of the lay-revenues during a vacancy. Queen Elizabeth kept the see of Ely vacant nineteen years.

All the bishops of a province, with respect to their archbishop, are called his suffragans. See SUFFRAGAN.

The B. of Durham had formerly a *palatine* jurisdiction, as it was called, in the county of Durham; and the B. of Ely had a similar secular authority in certain places; but these powers were transferred to the crown in 1836. The houses of bishops are called their palaces. In old times their palaces in London were extra-diocesan; and while residing there, they exercised jurisdiction in the same manner as in their own dioceses. This personal privilege is now extinct in the bishops; but Lambeth House, Croydon, Winchester Palace, and Ely House retain the privilege. A bishop makes a triennial visitation of his diocese.

The conferring of orders rests, in a great measure, with the discretion of the bishop. He can refuse to ordain without giving any reason, but he can ordain no person who does not subscribe to the queen's supremacy, the Book of Common Prayer, and the Thirty-nine Articles. See ORDINATION.

In England there are 56 Anglican bishops, of whom 21 are 'suffragan bishops.' The sees of bishops, besides the two metropolitan sees (Canterbury and York), are (with titles of suffragan bishops in parentheses): Bangor, Bath and Wells, Bristol, Carlisle, (Barrow-in-Furness), Chester, Chi-



The Great Bird of Paradise (*Paradisea apoda*).



King Bird of Paradise (*Paradisea regia*).



Birostrate Fruit (*Trapa bicornis*).

chester, Durham (coadjutor bp.), Ely, Exeter, Gloucester, Hereford, Lichfield (Shrewsbury), Lincoln (Nottingham), Liverpool, Llandaff, London (2 suffragans, Marlborough and Bedford), Manchester (coadjutor bp.), Newcastle, Norwich, Oxford (Reading), Peterborough (asst. bp.), Ripon (Richmond), Rochester (Southwark), St. Alban's, St. Asaph, St. David's (coadjutor bp.), Salisbury, Sodor and Man, Southwell (coadjutor bp.), Truro, Wakefield, Winchester (Guildford), Worcester. The bp. suffragan to the abp. of Canterbury has the title bp. of Dover; the abp. of York's suffragan the bp. of Beverley. Of the bps. of sees, the two abps. and the bps. of London, Durham, and Winchester are absolutely entitled to seats in the house of lords. The bp. of Sodor and Man is not a spiritual peer of the realm, neither are the coadjutor, suffragan, or asst. bps. The number of bps. entitled to sit in the house of lords is limited by law to 24, who have the privilege in the order of seniority.

In Ireland there are 13, including the two metropolitans, whose sees stand first—viz., Armagh and Clogher, Dublin and Kildare; Meath; Killaloe, Kilfenora, Clonfert, and Kilmacduagh; Tuam; Killala, and Achonry; Ossory, Ferns, and Leighlin; Cashel, Emly, Waterford, and Lismore; Down, Connor, and Dornore; Derry and Raphoe; Limerick, Ardfert, and Aghadoc; Kilmore, Elphin, and Ardagh; Cork, Cloyne, and Ross.

In British North America, there are nineteen sees; in the West Indies, six; in South America, one; in Africa, thirteen; in Asia, eleven; in Australasia, twenty-three; and in Europe, one—that of Gibraltar; and the B. at Jerusalem. Several of the above are missionary bishops. There are seven bishops of the Episcopal Church in Scotland; but the Established Church—the Church of Scotland—is Presbyterian.

In the United States, there are 82 bishops of the Prot. Episc. Chh., some being asst. bps., and some missionary. They exercise functions only in religious matters, in which their office is similar to that of the English prelates. They are chosen by the convention of clerical and lay delegates in the convention of the diocese which is to be under their charge, and are consecrated by the House of Bishops: the consecration is under rules established by the General Convention, which includes with the House of Bishops a house of clerical and lay delegates from all the dioceses.

In the Methodist Episcopal Church in the United States, the bishops are not diocesan, each with his distinct territorial jurisdiction; but are general superintendents and presidents in the whole church.

There are 2 archbishops and 17 Roman Catholic bishops in England. In Ireland, there are three Catholic archbishops and 24 bishops. The Roman Catholic hierarchy in Scotland was formally restored 1878, and has two archbishops and four bishops. The Rom. Cath. Church in the U.S. had (1903) one cardinal, 81 bishops, and 13 archbishops.

See article ECCLESIASTICAL TITLES ASSUMPTION ACT, also ARCHBISHOP; BOY-BISHOP. See Hooker, Burn, Black-

BISHOP—BISHOP'S WALTHAM.

stone, Lightfoot's *Christian Ministry*, and Hatch's Bampton Lecture (1880) on *Early Christian Organization*.

BISH'OP: beverage composed of red wine (claret, Burgundy, etc.), poured warm or cold upon ripe bitter oranges, (rejecting the white part between peel and pulp), sugared and spiced to taste, and drunk hot or cold. With white wine the beverage is called *cardinal*; with Tokay *pope*.

BISH'OP, ANNA: name by which the famous English singer ANNA (RIVIÈRE) (BISHOP) SCHULTZ is usually known. 1814–1884, Mar. 19; b. London; daughter of an artist named Rivière. In 1831 she became the wife of Sir Henry R. B. (q.v.). Her first appearance in public was in 1837. She gained great popular favor, and held high rank in both classical music and modern opera. In 1858 she became the wife of M. Schultz of New York.

BISHOP, BOY: see **BOY-BISHOP**.

BISHOP, Sir HENRY ROWLEY: 1786, Nov. 18—1855, Apr. 30; b. London: musical composer. His principal musical instructor was Signor Francesco Bianchi. In 1806, B. was appointed composer of ballet music at the opera. His most popular operatic entertainments were *Guy Mannering*; *The Slave*; *The Miller and his Men*; *Maid Marian*; *Native Land*; *The Virgin of the Sun*; etc.—all remarkable for their long flowing melodies, animated style, and true musical power. From 1810 to 1824, he was director of the music at Covent Garden Theatre. One of the first directors of the Philharmonic Soc., he for many years conducted the concerts of ancient music. He arranged several volumes of the *National Melodies*, and succeeded Sir John Stevenson as arranger of the airs selected by Moore for his *Melodies*. In 1839, June, he received the degree of Bachelor of Music from the Univ. of Oxford, and in 1841, Nov., was elected Reid prof. of music in the Univ. of Edinburgh. In 1842 he was knighted. In 1843, Dec., he resigned his Edinburgh chair, and in 1848, Feb., was elected prof. of music in the Univ. of Oxford. In his later years he was in very necessitous circumstances.

BISHOP-AUCKLAND: see **AUCKLAND, BISHOP**.

BISH'OP, ISABELLA L. (BIRD): writer of books of travel: b. England. She became a traveller for her health's sake without thought of entering the field of authorship; but was induced to prepare for the press the notes of a tour in the United States, and the great success of her first book, *The Englishwoman in America* (1856), decided her career. *The Englishwoman* was followed (1859) by *Aspects of Religion in the United States*. Then appeared successively, *Notes on Edinburgh* (1869); *The Hawaiian Archipelago* (1875); *A Lady's Life in the Rocky Mountains* (1879); *Unbeaten Tracks in Japan* (2 vols. 1880); *Journeys in Persia and Kurdistan* (1892). She was married to Dr. B. 1883.

BISHOP'S WALTHAM: town of Hampshire, Eng., about 10 m. e.n.e. of Southampton. Corn, leather, and malt form the chief trade of the town. It has been immemorially the property of the see of Winchester. There are the remains of a bishop's castle, built, 1135, by Henry de

BISIGNANO—BISMARCK-SCHOENHAUSEN.

Bloisking, King Stephen's brother, which was reduced to ruins during the civil wars of the 17th c. A gang of 'Waltham Blacks' infested the forest in this vicinity in the early part of the 18th c. The *Black Act* (q.v.) was passed, 1723, to put them down. Pop. (1891).

BISIGNANO, *be-sên-yâ'no*: town of Italy, province of Cosenza; on a hill near the junction of the Mucone with the Crati, about 15 m. n. of the town of Cosenza. It has a cathedral and a castle, trades in silk, and gives the title of Prince to the existing branch of the Sanseverino family. Pop. about 5,000.

BISMARCK, *bîz'mârck*: city, cap. of Burleigh co. and of N. D.; on the Missouri river and the Northern Pacific railroad. It was the cap. of Dak. Terr., and became the cap. of the new state after a spirited contest with rival cities. It contains the handsome capital of the former terr., erected 1883, U. S. land office, 12 hotels, 5 churches, 5 public-school buildings, St. Mary's Seminary (Rom. Cath.), former territorial penitentiary, chamber of commerce, 2 national banks (cap. \$150,000), 2 private banks, court-house, public hall, city hall, 1 daily and 2 weekly newspapers, and several important manufacturing. It has large shipments of wheat, oats, and potatoes; and is connected and does a large trade with the upper Missouri river forts, posts, and landings, by 4 lines of steamboats; with Williamsport, Winchester, Fort Yates, and Standing Rock Indian agency, to the s., by week-day stages; and with Washburn, Fort Stevenson, Fort Berthold Indian agency, and Villard, in the Mouse river country, to the n., by tri-weekly stages. Pop. (1890) 2,186; (1900) 3,319.

BISMARCK, HERBERT, Prince von: a German statesman; b. 1849, Dec. 28; son of Otto Edward Leopold, Prince von Bismarck-Schönhausen. He ranks among the ablest and shrewdest diplomatists of Europe. He was secretary to the London embassy till the retirement of his father, when he was charged provisionally with the foreign affairs of the empire. In 1886 he became secretary of state, and 1889, Jan., the first class of the Order of the Red Eagle was conferred on him by the emperor.

BISMARCK, Prince (OTTO EDWARD LEOPOLD VON BISMARCK-SCHÖNHAUSEN, *bis'mârck-shôn'how-sên*); German statesman: 1815, Apr. 1—1898, July 30; b. Schönhausen, Prussia. He was educated at the universities of Göttingen, Berlin, and Greifswald; studied law; was appointed lieut. in the Landwehr; became a member of the diet of Saxony 1846, and of the general diet 1847; and began his diplomatic career 1851, when he was appointed Prussian sec. of legation at Frankfort. In the following year he was sent to Vienna, and soon manifested a political hostility to Austria, and a desire to create a large political importance for Prussia. In 1858 a pamphlet was published and credited to his authorship, in which, under the title *Prussia and the Italian Question*, an antagonism between Austria and Prussia was shown, and an alliance be-

tween France, Prussia, and Russia urged. A year later he was appointed ambassador to Russia. He held the office till 1862, gained the confidence of the czar, and received many evidences of imperial favor. Early in 1862 the king sent him on a special mission to France, where he was cordially received by Napoleon III., who conferred on him the grand cross of the Legion of Honor. In Sep. following he was appointed minister of the king's house and of foreign affairs. Within a month he manifested the 'iron will' that characterized all his future public acts, and at the same time gave the strongest evidence of a knowledge of the king's confidence in him. He instituted a reactionary policy, and when the chamber of deputies rejected the budget after the upper house had adopted it, he dissolved the former in the king's name, Oct., and in the acrimonious debate announced that he would enforce his measures without the sanction of the deputies. The newspapers protested against his arbitrary act, and were severely punished, and a large number of prominent officials who had fearlessly criticised the new policy of the govt. were made to feel that the man at the head of affairs was not to be opposed with impunity. In 1863, Jan., the deputies adopted an address to the king, in which they accused B. of having violated the constitution. To this the minister made an energetic protest. On Feb. 8, the king made a secret treaty with Russia. When the deputies learned of it, through the Polish difficulties, they adopted a vote of censure against the ministry by a large majority. No opposition, however, swerved B. from his policy; and it seems altogether probable that the acquiescence of the king in the arbitrary development of B.'s policy, at this time, was based on an assurance from the minister that his ultimate object was the unification of all the German states. In 1864, the war against Denmark, in which Austria had co-operated with Prussia, led to a revelation of this part of B.'s plan. The German states became enthusiastic, and B. speedily emerged from the general disfavor. But he believed that the union he meditated was impossible under existing relations with Austria. He made an alliance with Italy, determined to exclude Austria from Germany, caused Prussia to secede from the confederation, and made an aggressive war on Austria 1866. Austria and her allies were defeated in a few weeks' campaign, June, and by the preliminary treaty of peace Austria agreed to retire from the German confederation. The immediate results of this movement were the annexation of Hanover, Electoral Hesse, Holstein, and other states to Prussia; the garrisoning of the free town of Frankfurt by Prussian troops, despite the protests of its citizens; the conclusion of treaties of peace and alliance between Prussia and Bavaria, Baden, and Würtemberg on the condition that in the event of war the king of Prussia should command the armies of the allied states; and the formation of the N. German Confederation, comprising 22 states with an aggregate pop. of 29,000,000. For his share in bringing about these important results, B. was

created a count, presented by the king with a valuable estate in Luxembourg, and appointed chancellor of the new confederation and pres. of its federal council.

By this time France had become alarmed at the rapid creation of this great milit. power on her border. When in 1870, July, it was announced that Gen. Prim, through a deputation, had offered the crown of Spain to Prince Leopold of Hohenzollern, French statesmen declared that France would never permit a Prussian prince to occupy the Spanish throne, and the French govt. through Count Benedetti demanded an explanation of the Prussian cabinet. The candidacy of the Hohenzollern prince was terminated by the king, but in spite of this fact, France declared war against Prussia, and within a few days the armies of both nations began moving (see FRANCO-GERMAN WAR). Now B.'s firm and dictatorial policy began to bear vital fruit. The allied German states threw their armies into the field, and Bavaria, Baden, and Würtemberg in particular gave most timely and effective aid to Prussia. B. accompanied King Wilhelm to the field, and remained with him to the close of the war. With the surrender of Napoleon III. and the occupation of Paris by the German troops, B. took the final step toward accomplishing this object. He dictated the terms of peace, which included the surrender of the French provinces of Alsace and Lorraine to Prussia; and 1871, Jan. 18, witnessed the fulfilment of his plans, when in the palace of the French kings at Versailles King Wilhelm was hailed and crowned emperor of united Germany. For the consummation of the consolidated empire, he was raised to the rank of prince, and appointed chancellor of the German empire by his grateful sovereign.

As chancellor of the empire, he manifested the same aggressiveness and independence as when he first dissolved the Prussian chamber of deputies. He first applied himself to the settlement of the ultramontane question, and his acts gave great offense to the Rom. Cath. party in Germany. He demanded that the Rom. Cath. Church should not encroach upon the rights of the state, and before the first struggle ended many hundred Jesuits were expelled from Germany, and several Rom. Cath. bishops were imprisoned for refusing obedience to the new ecclesiastical laws. He resigned the presidency of the state ministry 1872, Dec., though he continued to confer unofficially with the emperor on all matters of domestic and foreign importance, and was decorated with the order of the Black Eagle set in diamonds, by the emperor. In 1873, Oct., he was again appointed Prussian premier; 1874 he caused the arrest and trial of Count von Arnim on charges of having removed documents from the archives of the German embassy in Paris; and 1878 he presided over the celebrated 'Congress of Berlin,' called by the great powers to discuss and define the provisions of the treaty of San Stefano. Subsequently he aimed to found a German colonial empire; to counteract the work and influence of the social democrats by establishing a system of state socialism, with national

BISMARCK-SCHOENHAUSEN.

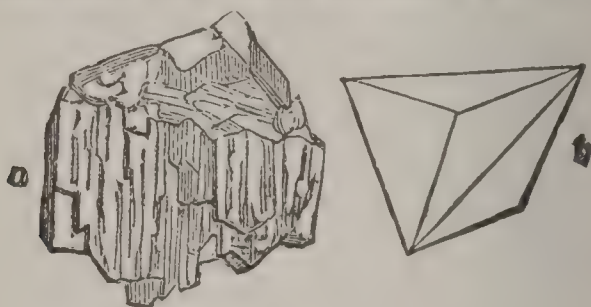
life insurance and other features; to strengthen the Austro-German alliance; and to prevent Russia from forming any alliance with France that would be detrimental to the interests of Germany. A modification of the strict ecclesiastical laws led to a better feeling between Germany and the Vatican, and prompted the pope to confer on B. the decoration of the order of Christ 1886.

On the death of Emperor Wilhelm I. 1888, Mar. 8, and the succession of the suffering 'Unser Fritz,' the eyes of the world were directed toward B. more keenly than they had been since the war with France. The crown prince and his wife were known to be imbued with a liberalism diametrically opposed to the spirit of B.'s public career. As was generally expected, Friedrich Wilhelm promised his people a reign in accordance with the constitution and liberal reforms. After this, it was thought B. would resign his public offices, as there could be little sympathy between him and his new sovereign. But the death of Friedrich Wilhelm III. 1888, June 15, interposed, and B. remained virtually the political director of Germany. With the accession of Wilhelm II., however, B. found an enthusiastic, chivalric, impulsive youth, ambitious to assume the personal control of all matters relating to the empire. Harmony was impossible. When the young emperor announced to B. his determination to exercise a general and absolute control of public affairs, and declared that the rights B. claimed as chancellor and pres. of the ministry under the cabinet order of 1852, Sep. 8, were an encroachment on the prerogatives of the sovereign, the creator of the united German empire resigned his offices 1890, Mar. 17, and five days afterward left Berlin. The emperor accepted his resignation, created him duke of Lauenburg (which title B. declined), and appointed Gen. George Leo von Caprivi (see CAPRIVI) his successor. B. began, 1892, his criticisms of the German foreign policy, in public speeches and 'interviews.' When the accredited organs of the govt. threatened him with legal prosecution. B. replied with defiance, exhorting the German people to 'produce a strong parliamentary majority, so as to prevent absolutism and bureaucracy.' In 1894 a happy reconciliation was effected by B.'s acceptance of the emperor's invitation to visit him in Berlin, where B. was received with utmost honors by the emperor and the people. He died in his 73d year from general debility at Friedrichsruh, Prussia, July 30, 1898.

BISMILLAH—BISMUTH.

BISMILLAH, int. *bīs-mīl'la* [Ar. In the name of God!]. an exclamation common among the Mohammedans.

BISMUTH, n. *bīz'mūth* [Ger. *wismuth*—said to be from *weis*, white; *muth*, lively mood: F. *bismuth*]: one of the elementary bodies; a hard brittle reddish-white metal, used in making pewter, printer's types, etc., non-malleable, but easily fusible. **BIS'MUTHINE**, n. *-īn*, sulphuret of bismuth of a grayish-tin color. **BIS'MUTHITE**, n. *-īt*, or **BIS'MUTITE**, n. *-mū-tīt*, a yellow carbonate of bismuth, or of a white or dull mountain-green. **BIS'MUTHAL**, a. *-al*, and **BIS'MUTHIC**, a. *-īk*, of or from bismuth. **BISMUTH-BLENDE**, *-blēnd*, a bismuth-silicate, with a little iron phosphate; same as Eulytite.—**BISMUTH** (sym. Bi, at. wt. 208, sp. gr. 9.823) is a highly crystalline, very brittle metal, of grayish-white color



Bismuth:

a, example of native bismuth from Redruth, in Cornwall;
b, crystal of bismuth.

with distinct reddish tinge, melting at 518° F., and expanding in the act of solidification. B. volatilizes at a high temperature; is the most diamagnetic of all known bodies; is little oxidized by air, but burns with bluish flame, when strongly heated. nitric acid somewhat diluted dissolves it freely. A mixture of B. 8 parts, lead 5, and tin 3, known as *fusible metal*, is used for taking impressions from dies and for other purposes; its fusion temperature is below 212° F. Spoons made of this alloy are employed in a familiar conjuring trick, in which they are seen to melt away when put in boiling water. The principal sources of B. are the smalt-works of Saxony, where ores containing B. and cobalt are worked. The ores are roasted, and afterward smelted in the pots of the smalt furnaces, with addition of iron, carbon, and slag. Two layers are thus obtained, the lower consisting of nearly pure B., which, because of its low melting-point, can be drawn off in the liquid state after the upper layer of cobalt-speiss has solidified. Of *oxides* of B. the most important is the trioxide, Bi_2O_3 , a straw-yellow powder obtained by gently igniting the neutral or basic nitrate: it is used in porcelain manufacture for fixing the gilding and for increasing the fusibility of fluxes, at the same time neutralizing the colors which are often communicated by them. *Trichloride of B.* (bismuthous chloride), BiCl_3 , is formed when B. is heated in a current of chlorine gas: it passes over as a white, easily fusible substance, which readily attracts moisture from air, being converted into a crystallized hydrate. *Normal Nitrate of B.*, $\text{Bi}(\text{NO}_3)_3 \cdot 5\text{H}_2\text{O}$, forms large transparent colorless crystals

BISNOW.

which are decomposed by water, yielding an acid solution and a brilliant white crystalline powder, hydroxy-nitrate of B., $\text{Bi}(\text{NO}_3)(\text{OH})_2$. An insoluble basic nitrate containing rather a larger proportion of B. oxide, is the substance sold under the names 'Pearl White,' 'Pearl Powder,' 'Blanc d'Espagne,' etc.: it is said to be injurious to the skin, rendering it yellow and leather-like. Among medicinal preparations of B. are the Subnitrate, the Subcarbonate, and the Salicylate. Of these the subnitrate is a heavy smooth white powder, only slightly soluble when taken internally, and for this reason is used extensively in gastric and intestinal troubles, where it acts in a purely mechanical manner, coating over the inflamed mucous membrane, and so preventing and allaying irritation. It is also feebly astringent, and tends to diminish secretion. The subcarbonate is very similar in its action to the subnitrate, but is more soluble. The salicylate of B. combines the antiseptic action of salicylic acid with the soothing effect of B., and therefore is a most useful preparation in diarrhea due to fermentation of the contents of the intestinal tract.

BISNOW, n. *bi-snō*: a member of a sect of Banyans (after whom the banyan-tree was named and which they consider sacred).* The Bisnows recognize but one god whom they call Ram-Ram (Most High), and who, according to their belief, created all things by his own power, without external agents. They constitute one of the four principal sects of the Banyans. Their food consists of fruits, vegetables, milk diet, etc.; and they abstain from meat and in general from everything that has life, pushing their scruples on this subject even to the point of using for fuel cow-dung dried in the sun and mixed with dry herbs, lest by using wood they might cause the death of some worms which might be imbedded in it. This respect for every living being is occasioned by their belief that human souls in their wanderings often pass into and inhabit the bodies of inferior animals: see TRANSMIGRATION. They solemnize the worship of their god, Ram-Ram, by songs and dances, with an accompaniment of many diverse instruments, drums, flutes, etc. In this sect the widows are not obliged to burn themselves with the bodies of their deceased husbands, but must preserve a perpetual widowhood.

* See also Sir T. Herbert's *A Relation of some Years travaile, begunne anno 1626; into Afrique and the greater Asia, especially the Territories of the Persian Monarchie and some parts of the Orientall Indies, and Iles adjacent*, London, Printed by William Stansly, and Jacob Bloom, 1634.

BISON.

BISON, n. *bī'zōn* [F. *bison*—from L. or Gr. *bison*]: a kind of wild ox, with short black rounded horns, and a large fleshy hump on the shoulders. The ancients gave the name to an animal of the same genus with the ox (q.v.) still called the B., or the European B. (*Bos Bison* of some naturalists, *Bos Urus* of others, though properly the *Urus* (q.v.) or Aurochs is a distinct animal.) This animal at one time abounded in most parts of Europe, but is now found only in the forests of Moldavia, Walachia, Lithuania, and Caucasus. Herds of bisons, carefully protected by the emperor of Russia, and believed to amount to about 800 in all, roam through the great forest of Bialowieza, in Lithuania. The B. differs from all varieties of the common ox, in the arched line of the back, which rises in a sudden elevation behind the neck; the hump which is formed not consisting, however, of mere fat, but in great part of the very thick and strong muscles which support the large head. It is remarkable for strength in the fore-parts, and trees of five or six inches in diameter cannot withstand the thrusts of old bulls. It is capable of repelling all the attacks of the wolf or bear, rushing upon, overthrowing, and then trampling an adversary. Its horns are short, tapering, very distant, spreading, a little curved inwards at the point. They are affixed not at the extremities of the most elevated salient line of the head, as in the ox, but considerably in front of it. The figure of the forehead differs also from that of the ox in its greater breadth, and in its convex profile. Another important anatomical difference is in the number of ribs, of which the B. has fourteen pair, while the ox has only thirteen; and the vertebræ of the tail are fewer, being only nineteen instead of twenty-one. The hair of the forehead is long and shaggy; that under the chin and on the breast forms a sort of beard; and in winter the neck, hump, and shoulders are covered with long woolly hair, of a dusky brown color, intermingled with a short, soft, fawn-colored fur. This long hair is gradually cast in summer. The legs, back, and hinder-parts are covered with short dark-brown hair. The tail terminates in a large tuft. The females are not so large as the males, nor do they exhibit the same shagginess of the fore-parts. The B. is the largest quadruped now existing in Europe, although within the historic period there appears to have existed with it an ox exceeding it in size; and it appears to have been this ox, and not the B., which was called *Urus* (q.v.) by the ancients, although their *Bonassus* (or *Bonassus*) was probably the same with the bison. The food of the B. consists of grass and brushwood, and the leaves and bark of young trees. Its cry is peculiar, 'resembling a groan or a grunt, more than the lowing of an ox.' It does not attain its full stature till after its sixth year, and lives about thirty or forty years. The period of gestation appears to be the same with that of the ox. The B. has never been reduced to subjection by man, and the domestication even of individuals taken young has been very partial. It generally shows a great aversion to the domestic ox. The common statement, however, that the B. calf invariably refuses to be suckled by the domestic

BISON.

cow is contradicted on the excellent authority of the master of the imperial forests in the Russian govt. of Grodno.—The B. is generally very shy, and can be approached only from the leeward, its smell being very acute. It is easily provoked, and is not approached without danger. It runs very swiftly, although it cannot long continue its flight, galloping with its head very low, so that the hoofs are raised higher than the head.

There is no historical evidence that the B. ever existed in Britain; but remains of this, or of a very closely allied species, are found in pliocene fresh-water beds in several parts of England, as well as on the continent of Europe. The size of these B. bones is, however, so great as of itself to cause a doubt of the identity of the species, and the horns are longer in proportion. The fossil B. has been called *Bison priscus*; *Bison* being by some naturalists separated as a genus from *Bos*, upon the ground chiefly of the osteological differences in the head.

The American B. (*Bos Americanus* of some naturalists, *B. Bison* of others) is interesting as the only species of the ox indigenous to Amer., though the *Bovidæ* include the Amer. antelope, Rocky Mt. sheep and goat, and the musk-sheep or 'musk-ox.' The B. is called *Buffalo* by the Anglo-Americans, although it is very different from the Buffaloes (q.v.) of the old world. Until within a few years it was found in vast numbers in the great prairies between the Mississippi and the Rocky Mountains; it occurs as far n. as the vicinity of Great Marten Lake, lat. 63° or 64°; extensive level and marshy tracts there affording it suitable food.

The following account is a record of the past, the bison having become nearly extinct. 'It was probably rare to the e. of the Appalachians, even on the first settlement of Europeans. Within the present century, however, it was found in the w. parts of the state of New York, and in large numbers in Ohio; but it has for many years disappeared from the whole region e. of the Mississippi, and it is necessary to advance about 100 m. w. of that river before encountering it; indeed, it is now becoming rare where, in its old haunts on the far western prairies, enormous herds formerly congregated, and great plains were sometimes spotted and darkened with bison as far as the eye could reach; 'countless thousands' are described as coming to refresh themselves in stagnant pools; and their paths are said to have been, in some parts of the wilderness, as frequent and almost as conspicuous as the roads in populous parts of the United States. The advance of civilization, narrowing the animal's range for food, has combined with the brutal and wasteful destruction by hunters, to bring the B. to the verge of extermination.

Until late years about 300,000 Indians were supposed to be subsisting almost entirely on the flesh of the B. The spear and the bow and arrow are still somewhat used by them in hunting it, though many of them also use firearms. They pursue it frequently on horseback; but the hunter, whether on horseback or on foot, has often much difficulty in getting within shot, on account of its keenness of scent,

BISON.

and its speed. The chase of the B. is also very dangerous, as it is apt to turn upon an adversary, and even a fleet horse cannot always escape it. Great numbers, however, are sometimes killed when the hunters can succeed in throwing the herds that are scattered over the plains into confusion, so that they run wildly, without heeding whither. Another expedient of the Indians is to set fire to the grass of the prairies around them, when they retire in great consternation to the centre, and are easily killed. A sort of pound or enclosure is sometimes made, with a long avenue leading to it, and an embankment of snow, such that when the animals have descended over it they cannot return, and by this means many are captured and killed. Livingstone describes a similar expedient in use for killing wild animals in s. Africa. Sometimes, also, the Indians contrive to throw them into consternation, and to make them run towards a precipice, over which many of the foremost are driven by the crowds which throng up behind.

'The American B. is very similar to the European. In



American Bison.

general, it is of rather smaller size, but not always, and it is said sometimes to attain a weight of 2,000 lbs. Its limbs and tail are shorter, and the tail consists of fewer vertebræ. The horns are shorter and more blunt. The fore-parts are still more shaggy, and retain more of their shagginess in summer. The ground upon which many naturalists have rested their chief confidence of specific difference has been, however, the presence of an additional pair of ribs, the American B. being said to have fifteen pair; but Mr. Vasey has recently ascertained that, like the European B., it has only fourteen. The more gregarious habit may perhaps be accounted for, like that of the American beaver, by difference of circumstances.

The wolf is quite unable to contend with the B., but many wolves often hang around the herds, to devour calves which may stray or aged animals which have become too weak to keep up with the rest. These have sometimes been seen assailed by whole packs of wolves, and dealing death to many of their assailants, before they were compelled to yield to numbers and hungry pertinacity. The only American animal that is singly capable of overcoming the B. is the grizzly bear., See BEAR.

BISSAGOS ISLANDS—BISSEN.

The flesh of the B. is very good and differs from that of the ox in having a sort of venison flavor. The hump, in particular, is esteemed a delicacy.—*Pemmican* (q.v.), so much the food of fur-hunters and northern *voyageurs*, is made of the flesh and fat of the bison.—The tallow forms an important article of trade. One bull sometimes yields 150 lbs. The skins are much used by the Indians for blankets, and when tanned, as coverings for their lodges and beds. A blanket of B.'s skin is often sold for \$15 or \$20 in Canada, to be used as a travelling cloak or wrapper. The Mandan Indians make canoes of B. skins spread upon wicker-work frames. These canoes have the round form of the Welsh *coracle* (q.v.). The long hair or fleece is spun and woven into cloth; stockings, gloves, etc., are also knitted of it. A male B. yields from six to eight lbs. of this long hair.

The above account of the numbers, the killing, the flesh, and the commercial value of the American B. was true in the memory of elderly persons now living. It is thought (1894) that less than a hundred of the species survive, besides a few in confinement.

BISSAGOS, *bis-sâ'gōs*, or BIJUGA, *bi-jó'ja*, ISLANDS: group of small volcanic islands, about 20 in all, off the w. coast of Africa, lat. $10^{\circ} 2' - 11^{\circ} 42' \text{ n.}$, and long. $15^{\circ} - 17^{\circ} \text{ w.}$; opposite the mouth of the Rio Grande. The islands are inclosed by a reef, and, with a few exceptions, are thickly wooded. Many of them appear to be densely peopled by a savage, thievish, negro race, who cultivate maize, bananas, and palms, and feed cattle and goats, which constitute their chief wealth. There are several fine ports. On one of the islands, Bulama, the British formed a settlement, 1792, but abandoned it the following year, on account of its unhealthiness. Bissao, one of the group, on which there is a Portuguese settlement, has a pop. of 8,000. It carries on a large trade in slaves, nearly all its European inhabitants being engaged in the traffic. It has also a trade in rice, wax, hides, etc., and imports annually about £20,000 worth of British manufactured goods.

BIS'SEN, WILHEM; 1798–1868; b. near Slesvig: Danish sculptor. He studied his art for ten years in Rome, under the guidance of his countryman, Thorwaldsen. Returning home, he executed a number of excellent works (a bust of Oersted, Atalanta hunting, etc.). In 1841, he returned to Rome, being commissioned by the government to make 18 statues larger than life. With these he produced a Venus, and a charming piece, *Cupid sharpening his Arrow*. Being recalled to Copenhagen, he was commissioned to execute a frieze several hundred feet long for the great hall of the palace, representing the development of the human race according to the Greek mythology. Thorwaldsen, in his will, appointed B. to complete his unfinished works and have charge of his museum. In 1850 he was made director of the Acad. of Arts, Copenhagen. At the Paris Exhibition, 1855, he was the only sculptor who represented Danish art.

BISSEXTILE—BISTORT.

BISSEXTILE, n. *bis-sĕks'tĭl* [L. *bissextilis*—from *bis*, twice; *sextus*, sixth]: every fourth year—so called by the anc. Romans, because in that year the sixth day of the calends of March (Feb. 24) was reckoned twice; leap-year. **ADJ.** pertaining to leap-year.

BISSON, a. *bis'ŏn* [AS. *bisen*, blind: Dut. *bij-ziend*, short-sighted]: in *OE.*, near-sighted; purblind; blinded; also spelled **BEESOME**, and **BEESEN**.

BISTORT, n. *bis'tört* [L. *bis*, twice; *tortus*, twisted], named from the twisted or contorted appearance of its root. The **ALPINE BISTORT** (*P. viviparum*) dwarf, with a linear spike, grows on the White Mts., Lake Superior, and n. The **Eur. SNAKEWEED** has leaves tapering



Bistort (*Polygonum Bistorta*).

into a long footstalk, and one dense terminal cylindrical spiked raceme of flesh-colored flowers. The root is about the thickness of the little-finger, blackish brown externally, reddish within, and tortuous. The whole plant is astringent, containing much tannin; the root is one of the strongest vegetable astringents, and is much used in medicine, both internally and externally, in hemorrhages and many other complaints. B. is a native of meadows in Europe. See **POLYGONUM**.

BISTOURY—BITCH.

BISTOURY, n. *bis'tûr-î* [F. *bistouri*, an incision-knife—from *Pistoria*, now *Pistoja*, in Tuscany, once celebrated for their manufacture]: a small knife or scalpel for surgical purposes.

BISTRE, or **BISTER**, n. *bis'ter* [F. *bistre*, prepared soot: Ger. *biester*, dark-brown, *bistre*]: wood-soot; a pigment of a warm brown color, prepared from the soot of wood especially beech. It is used in water-colors after the manner of Indian ink.

BISTRITZ, *bis'trits*: fortified town of Transylvania, beautifully situated on the Bistritz river, in a fine valley about 50 m. n.e. of Klausenburg. In its vicinity are the remains of an ancient castle, once the residence of the illustrious Hunyads. It has several large cattle-fairs, but its former extensive general trade is now entirely gone. Forming, as it does, the last strong position in the n.e. of Transylvania, it was repeatedly during 1848–49 the scene of hot strife between the Hungarian and Austrian generals. Pop. (1880) 8,063; (1890) 9,109.

BISTRITZ: river rising in e. Hungary, flows s.e. through Bukowina and Moldavia, and joins the Sereth near Baku, after a course of 110 m. It is called the Golden B., on account of the auriferous character of its sands.

BISULCOUS, a. *bî-sûl'kûs* [L. *bis*, twice; *sulcus*, a furrow]: cloven-footed, as swine or oxen.

BISULNUG'GUR, or **BISANAGAR**: town of India, in Guzerat, in the territories of the Guicowar, 82 m. n.w. of Mhow. It has a large transit trade, and manufactures cotton cloths. Pop. 18,000.

BISULPHATE, n. *bî-sûl'fât* [L. *bis*, twice; *sulphur*, sulphur]: a sulphate containing two equivalents of sulphuric acid to one of the base.

BIT, n. *bît* [AS. *bite* or *bîta*, a bite or morsel: Dut. *beet*, a bite (see **BITE**)]: a small piece; a morsel; a mouthful.

BIT, n. *bît*: boring tool designed to be rotated by means of a bit-stock; used by carpenters and artificers in metal. **BIT-STOCK**, n. *bît'stôk*, apparatus for rotating a wood or metal-boring bit; a brace.

BIT, n. *bît* [AS. *bitol*: Icel. *bitill* (see **BITE**)]: the part of the bridle which the horse bites; the iron mouth-piece of a bridle: V. to put the bit in a horse's mouth; to restrain. **BIT'TING**, imp. **BIT'TED**, pp.

BIT, or **BITT**, in Ship-building: a frame composed chiefly of two short but strong vertical timbers, fixed into or upon the deck in the fore-part of the vessel. Its main purpose is for fastening the cable when the ship rides at anchor, and for 'leading' the principal ropes of the rigging. To 'bit the cable,' is to fasten it round the bit. Various kinds are called 'riding-bits,' 'Elliott's bits,' 'Carrick-bits,' 'paul-bits,' 'jeer-bits,' 'topsail-sheet-bits,' etc. Having to resist great strains, the bits are strongly bolted to the beams that support the deck.

BITCH, n. *bîch* [AS. *bicce*: Icel. *bikkia*, a little dog, a

BITCHE—BITHYNIA.

bitch: Gael. *bith*, a woman; Ger. *beize*, a bitch]: the female of the dog kind; an opprobrious term.

BITCHE, or **BITSCH**, *bitch*: German town of Alsace-Lorraine, in a wild and wooded pass of the Vosges, about 16 m. e.s.e. of Sarreguemines. Its citadel, on a precipitous and isolated rock in the middle of the town, is well supplied with water, defended by 80 cannon, has accommodation for a garrison of 1,000 men, and is considered almost impregnable. The Prussians under the Duke of Brunswick attempted to surprise it, 1793, but failed. The people are engaged in the manufacture of matches, watch-glasses, and porcelain. The German spelling is *Bitsch*. Pop. 3,000.

BITE, v. *bít* [AS. *bitan*; Goth. *bitan*; Icel. *bita*; Goth. *bijten*, to bite]: to tear; to pierce; to break or crush with the teeth; to pinch with cold; to reproach by stinging words; to pain or wound: N. the seizure of anything by the teeth; wound made by the teeth, a morsel; a mouthful. **BITING**, imp. *bítting*: ADJ. severe; sharp; sarcastic. **BIT**, pt. *bít*: N. a small piece of anything; a tool that bores. **BITTEN**, pp. *bít n*: ADJ. in *bot.*, applied to a leaf, root, or corolla terminating abruptly, as if bitten off short. **BITER**, n. *bí'tér*, one who. **BITINGLY**, ad. *-lî*, in a biting manner; sarcastically. **TO BITE IN**, in *etching*, to eat into or corrode the uncovered part of metallic plates by an acid. **TO BITE THE DUST**, to fall to the ground in the agonies of death.

BITERNATE, a. *bi-ter'nât* [L. *bis*, twice; *terni*, three by three] in *bot.*, applied to compound leaves which form three leaflets, each of which is again divided into three.

BITHOOR, *bî-thôr'*: town in India, dist. of Cawnpore, lieut. governorship of N.W. Provinces; on the right bank of the Ganges, about 12 m. n.w. of the city of Cawnpore. B., particularly devoted to the worship of Brahma, has numerous pagodas; and is a favorite resort for pilgrims, who here, as at Benares and Bindraban, have access to the sacred stream for ablution, by means of elaborately constructed ghauts. During the mutiny of 1857, B. was the stronghold of Nena Sahib, and here also Havelock more than once exacted retribution. Pop. abt. 9,000.

BITHYNIA, *bî-thîn'i-a*: ancient division of Asia Minor, separated from Europe by the Propontis (Sea of Marmora); and the Thracian Bosphorus (Strait of Constantinople), and was bounded n. by the Euxine, and s. by Galatia, Phrygia, and Mysia. Its e. limits were not very clearly defined, but extended at least as far as Paphlagonia. It contained the famous Greek cities or colonies of Chalcedon, Heraclea, etc.; and at later periods, Nicomedia, Nicæa, and Prusa were flourishing cities of B. The inhabitants were supposed to be of Thracian origin. The country was subdued (B.C. 560) by Cræsus of Lydia, and five years later fell under the Persian dominion. But about B.C. 440 or 430, it became an independent kingdom under a dynasty of native princes, who made Nicomedia their capital. The last king, Nicomedes III., made the Romans his

heirs, and with a large addition from the Pontic kingdom, B. became a province of the empire (B.C. 74). Under Trajan, B. was governed by Pliny the Younger, whose letters to the emperor on the administration and condition of the province contain the well-known passage respecting the Christians. The emperor Diocletian made Nicomedia his habitual residence. In 1298, Osman the Turk broke into the country; and in 1328, Prusa, or Brusa, then the chief town of B., became cap. of the kingdom of the Osmanli.

BITLIS, *bit-lēs'*: town of Asiatic Turkey, in the vilayet of Erzerum; lat $38^{\circ} 24'$ n., long. $42^{\circ} 5'$ e., about 120 m. s.e. from Erzerum. It is 5,156 ft. above the level of the sea, in a deep ravine traversed by the river Bitlis, one of the head-streams of the Tigris. B. is a straggling, irregular place, covering a large surface of ground, and surrounded by bare limestone mountains, rising to a height of about 2,000 ft. above the valley, which is filled with orchards and gardens, and watered by numerous streams and springs. It has 3 mosques, about 12 convents belonging to the howling dervishes, who appear to have made B. their headquarters, several well-stocked bazaars, and extensive manufactures of cotton cloths, celebrated for their bright red dye. It has also a very extensive trade. The import of British goods is small. The Persians defeated Solyman the Magnificent near B., in 1554. Pop. abt. 15,000 Mohammedan, and 1,000 Armenian families.

BITONTO, *be-ton'to* (ancient *Butuntum*): town of Italy, province of Bari, 10 m. w.s.w. of the city of Bari. It is in a fruitful plain about 5 m. from the sea, is well built, is, conjointly with Ruvo, the see of a bishop, and has a fine cathedral, monasteries, and a nunnery. There is extensive trade in a wine called *Zagarello*, which is largely cultivated in the environs. B. is the birthplace of Gior-dani, the mathematician. In its vicinity, the Spaniards, under Count de Montemar, gained a splendid victory over the Austrians, 1734, May 25, the result of which was that Spain re-obtained possession of the kingdom of Naples. Pop. 23,000.

BITSCH: see **BITCHE**.

BITTACLE, n. *bit'tă-kl*: see **BINNACLE**.

BITTENFELD, HERWARTH VON. 1796–1884, Sep. 2: Prussian general, one of the three leaders that commanded the invasion into Bohemia, 1866. B. gained his first martial laurels in the War of Liberation, especially in the battle of Leipzig. In 1848, he commanded the first regt. of the Guards. In 1863, raised to the rank of general, he acquired great fame by his daring crossing of the Sund, and capture of the isle of Alsen. In the campaign of 1866, he was intrusted with the occupation of Saxony, and then with the command of the army which advanced from Saxony into Bohemia. He contributed largely to the brilliant victories of Hünnerwasser, Gitschin, München-grätz, and Königgratz. In 1870, on the outbreak of the war, B. was made gov. of the Rhine provinces, in 1871 a

BITTER.

gen. field-marshal. In the war of 1866, one of his sons fell; in that of 1870, two were killed.

BITTER, a. *bīt'tēr* [Icel. *beitr*; Goth. *baitrs*; Ger. *bitter*, biting, stinging: AS. *biter*, bitter]: biting to the taste; sharp; severe; reproachful; satirical; painful to the feelings or mind; distressing. BIT'TERNESS, n. bitter or biting taste; severity of temper; hatred; sharpness. BIT'TERLY, ad. *-li*, in a bitter manner; sorrowfully. BITTERS, n. plu. *bit'tērs*, a liquor, generally spirits, in which bitter herbs or roots have been steeped. Bitters are in three classes—simple, aromatic, and special.—The Simple bitters include such remedies as quassia, gentian, calumba, and dogwood. They increase secretion from the mucous membrane, in the mouth they promote flow of Saliva (q.v.), and in the stomach they cause increased production of gastric juice. As starchy foods are acted on by the digestive ferment contained in the saliva, and albuminoids by the gastric juice (see DIGESTION), it follows that the ingestion of bitters will increase the digestive capacity. The sense of bitterness increases the desire for food, which with the increased power to digest enables the patient to eat and assimilate more. It is thus that bitters act as a tonic and not by any inherent nutrient power of the drug itself.—The Aromatic bitters contain in addition to the properties of the simple bitters an aromatic principle, and are also more or less astringent because of the presence of tannic or gallic acid. The principal aromatic bitters are Virginia snake-root and wild-cherry bark, useful in catarrhal inflammation of the respiratory tract.—The Special bitters have peculiar properties not found in either of the foregoing groups. The principal special bitters are Cinchona and its preparations, Eucalyptus, and Hydrastis. They possess, in addition to the same properties as the simple bitters, special virtues in certain conditions; e.g. quinine, the active principle of Cinchona, in small doses acts as simple bitters, but in sufficient doses is the great remedy in malarial affections (see QUININE: MALARIA). BIT'TERISH, a. slightly bitter. BIT'TERISHNESS, n. BITTERSAP, n. the largely crystalline and easily cleavable kinds of *dolomite* or magnesian limestone, from the magnesia in it, which the Germans call *Bitter Salt* (see DOLOMITE). BITTER-SWEET, woody nightshade; the *Solanum dulcāmāra*, ord. *Solanācēæ*. BITTERWORT, the plant gentian; the *Gentiāna luteā*, ord. *Gentianācēæ*. BITTERN, n. *bit'tern* (bitter liquid, or salt oil), a bitter oily liquid obtained during the preparation of common salt (q.v.). When the mother-liquor of the evaporating pans ceases to deposit crystals of common salt, there is left behind in the boilers the material called bittern. It consists principally of a strong solution of common salt, with Epsom salts, and other compounds of magnesia. The B. at salt-works is generally run into tanks, and during winter, it is employed as a source of Epsom salts. The B. is treated with a little sulphuric acid, which converts the chloride of magnesium ($MgCl$) into sulphate of magnesium ($MgSO_4$), and on the liquid being allowed to cool, the crystals of Epsom salts (or sulphate of magnesia) separate.

BITTER CRESS—BITTERN.

BITTER CRESS: see CRESS.

BITTER KING (*Soulaurea amara*): shrub or small tree of the nat. ord. *Polygalaceæ* (q.v.), native of the Indian archipelago, which has received its name from its intense bitterness. The genus differs from the usual structure of the order in its regular flowers. The B. K. has large oval leaves and axillary racemes of flowers. It is used medicinally in fevers and other diseases.

BITTERN: see under BITTER.

BITTERN, n. *bittërn* [It. *bittore*; F. *butor*, the bittern—from mid. L. *butōriūs*], (*Botaurus*): according to some modern ornithologists, a genus of the Heron (q.v) family.



Common Bittern (*Botaurus stellaris*).

(*Ardeidæ*); but regarded by others as a mere sub-genus of Heron (*Ardea*), and not a very well-defined one. Bitterns are indeed chiefly distinguished from herons by the long, loose plumage of the neck, which they have the power of erecting at pleasure, with the rest of their clothing feathers so as greatly to increase their apparent size. The back of the neck, however, is merely downy, or almost bare, the long feathers being on the front and sides. Bitterns also differ from herons in the greater length of their toes, the middle toe being as long as the shank. They are almost all solitary birds, inhabiting reedy and marshy places, where they lie hid during the day, and will almost allow themselves to be trodden upon ere they take wing; they feed during the night, and then, also, often rise spirally to a

BITTERSWEET.

great height into the air, and emit loud resounding cries. Their food consists chiefly of frogs, and partly, also, of fish, lizards, water-insects, etc., and even of small birds and quadrupeds. The claw of the middle toe is serrated on the inner edge, probably to aid in securing slippery prey. The COMMON B. (*B. stellaris* or *Ardea stellaris*) is a bird very widely diffused over the old world, being found in almost all, at least of the temperate, parts of Europe, Asia, and Africa, which are sufficiently marshy for its manner of life. It is now rare in Britain, owing to drainage; but was formerly more common, and in the days of falconry, was carefully protected by law in England, on account of the sport which it afforded. Its flesh also was in high esteem, and is not rank and fishy, like that of the herons generally. In size, it is rather less than the common heron; the bill is about four inches long, the feathers on the crown of the head are greenish black, and the plumage in general of a dull yellow color, beautifully and irregularly marked and mottled with black. The B. makes a rude nest of sticks, reeds, etc., in its marshy haunts, and lays four or five greenish-brown eggs. It has a peculiar bellowing cry, which has obtained for it such English provincial names as Mire-drum, Bull of the Bog, etc., and many of its appellations in other languages, perhaps even its name B. (*Bitour*, *Botur*, *Botaurus*). Some naturalists used to assert that the booming cry of the B. was produced by the bird inserting its bill into a reed; that notion, however, has long since been proved false. When assailed, it fights desperately with bill and claws; and it is dangerous to approach it incautiously when wounded, as it strikes with its long sharp bill, if possible, at the eye.—The LITTLE B. (*B. minutus* or *Ardea minuta*) is common in some parts of Europe, but rare in Britain. Its whole length is only about thirteen inches.—The AMERICAN B. (*B. lentiginosus*, or *A. lentiginosa*), a species almost equal in size to the common B., and very similar to it in habits and voice, has occasionally been shot in Britain. It is common in many parts of N. America, migrating n. and s. according to the season. The crown of the head is reddish brown, and the colors and markings of the plumage differ considerably from those of the common B.—The LEAST B. (*B.* or *A. exilis*) is another N. American species, the length 14 in., the crown and back greenish-black, and neck chestnut. The AUSTRALIAN B. (*B.* or *A. australis*) is generally diffused throughout Australia, wherever marshes or sedgy rivers occur. In habits it closely resembles the B. of Europe. The head and upper parts generally are purplish brown, except the wings, which are buff, conspicuously freckled with brown; the throat, breast, and belly mottled brown and buff.

BITTERSWEET, or WOODY NIGHTSHADE (*Solanum Dulcamara*): plant found in hedges and thickets in most parts of Europe, Asia, and N. America. The root is perennial; the annual stems climbing and shrubby, many ft. in length; the leaves ovate-heart-shaped, the upper ones spear-shaped; the flowers purple, in drooping corymbs,

BITTER VETCH—BITTERWOOD.

much resembling those of its congener, the potato, but much smaller, followed by ovate red berries of tempting appearance, which, being poisonous, are not unfrequently the cause of serious accidents, particularly to children. The twigs, collected in autumn after the leaves are fallen,



Bittersweet (*Solanum Dulcamara*):

a, branchlet with flowers and fruit, reduced; **b**, a flower, reduced are used as a diaphoretic and diuretic.—The **WAX-WORK BITTERSWEET** (*Celastrus scandens*), with orange pods and scarlet-covered seeds, belongs to another family.

BITTER VETCH: see **OROBUS**.

BITTERWOOD: certain species of the genus *Xylopia*, trees and shrubs remarkable for the bitterness of their wood, particularly the West Indian *X. glabra*. Furniture made of this wood is safe from the attacks of insects.—The genus *Xylopia* belongs to the natural order *Anonaceæ* (q.v.). The fruit of some of the species, particularly *X. sericea*, is highly aromatic and pungent like pepper. *X. sericea* is a large tree, a native of Brazil; its bark is used for making cordage, which is excellent.

BITTERWOOD is the name also of *Pieræna excelsa* (formerly *Quassia excelsa*), a tree of the nat. ord. *Simarubaceæ* (q.v.), native of Jamaica, the wood of which is used in medicine for the same purposes as *Quassia* (q.v.), and often under that name; indeed, it is probable that all the present quassia of the shops is really this wood. It is, botanically, very nearly allied to the true quassia, and possesses very similar properties, containing the crystallizable bitter principle called *Quassite* or *Quassin*. The wood, which is intensely bitter, is a very useful stomachic and tonic; an

infusion of it is a well-known and useful fly-poison; and it appears to act as a powerful narcotic on many quadrupeds.

BITTS, n. plu. *bīts* [Icel. *biti*, a beam in a house or a ship. Sw. *beting*, a bitt: F. *bites*: Sp. *bitas*]: two strong pieces of timber in the fore-part of a ship on which the cables are fastened when she lies at anchor; the perpendicular supports of the windlass. To BITT, v. to put round the bitts. BIT'TING, imp. BIT'TED, pp.

BITUMEN, n. *bī-tū'mēn* [L. *bitūmen*—from Gr. *pītus*, the pine or pitch tree: F. and It. *bitume*]: mineral pitch or tar; one of the family of mineral resins or hydrocarbons, highly inflammable, and burning with much smoke and flame,—in its purest and most fluid state, it is called *naphtha*—of the consistence of oil, *petroleum*—as slaggy mineral pitch, *maltha*—as elastic mineral pitch or caoutchouc, *elaterite*—as a black, hard, brittle, and glossy mineral, *asphalt*. BITU'MINATE, v. *-mī-nāi*, to impregnate with bitumen. BITU'MINATING, imp. BITU'MINATED, pp. BITU'MINIFEROUS, a. *-if'er-ūs* [L. *fero*, I produce]: producing bitumen. BITU'MINIZE, v. *-mī-nīz*, to prepare or coat with bitumen. BITU'MINIZING, imp. BITU'MINIZED, pp. *-nīzd*. BITU'MINIZA'TION, n. *-nī-zā'shūn*, the natural process of being converted into bituminous matter. BITU'MINOUS, a. *-mī-nūs*, full of or containing bitumen. BITUMED, a. *bī-tūmd'*, in *OE.*, smeared with pitch.

BITU'MEN: a mineral substance, remarkable for its inflammability and its strong peculiar odor; generally, however, supposed to be of vegetable origin. The name, which was in use among the ancient Romans, is variously employed, formerly to include a number of the substances called *Mineral Resins* (see RESINS), now the mixtures of hydrocarbons such as, e.g., *Naphtha* (q.v.) and *Petroleum* (q.v.) or Mineral Oil, and the solid ones called *Mineral Pitch*, *Asphalt* (q.v.), *Mineral Caoutchouc*, etc. Sometimes in a more restricted sense it is applied by mineralogists to only some of these, and by some mineralogists to the solid, by others to the liquid ones. All these substances are, however, varying mixtures essentially alike. Petroleum passes into viscid bitumen, sometimes called *maltha* or *pittasphalt* or mineral tar, and this grades insensibly into asphalt, which is solid bitumen. The fluid forms become more or less solid by loss of the more volatile components, and by oxygenation. Near the centre of the Baku region, on the Caspian Sea, a light naphtha is found, while on the border of the region is a thicker petroleum, passing into solid asphalt. Petroleum is composed, of different series of hydrocarbons, such as the paraffins, the olefines, the benzenes. Asphalt, (q.v.), or B. solidified, yields a little of oils vaporizable at 100°; much of heavy oils (sometimes 85 per cent.) from 100° to 250°; resin-like substances soluble in alcohol; lustrous, pitch-like substances soluble in ether; others black or brownish, soluble in neither; and some nitrogenous, amounting often to 1 or 2 per cent. of nitrogen.

The old way of accounting for the origin of these sub-

stances was by supposing that some 'volcanic' force acted on beds of bituminous coal. It is now abundantly illustrated in both hemispheres that the origin may be in unaltered strata of any age from Silurian up to Tertiary, at the ordinary temperatures of inconsiderable depths, time accomplishing the results that were once referred to volcanic agency. The material required was doubtless organic, but it is a question how far the immense animal life of the geological past contributed to the result. Some animal fossils contain B. In a number of localities, there is reasonably a connection with bituminous shales, with a vegetable history, and largely found in rocks older than the Carboniferous.—Mineral Caoutchouc or Elastic B., called *Elaterite* (CH_2), is brown and flexible; one kind, like india-rubber, will erase pencil marks: one of the few places where it is found is a coal-mine near Southborough, Mass.

BITU'MINOUS COAL: varieties of coal which contain a large percentage of volatile matter. They yield, on their destructive distillation, considerable gas, remarkably pure and with good illuminating qualities, and are consequently largely used for that purpose. See COAL.

BITU'MINOUS LIMESTONES: limestones impregnated and sometimes deeply colored with bituminous matter, obtained from decaying vegetables, or, more probably, from the decomposed remains of those animals, the hard parts of which form so large an amount of the rock.

BITU'MINOUS SHALES: indurated beds of clay occurring in the coal-measures, and containing such an amount of carbon and volatile matter that they are able to keep up combustion when mixed with but a little coal. They are indeed impure coal, with a large percentage of ash or earthy matter, which after burning retains the original form. See COAL.

BITZIUS, *bít'se-us*, ALBERT (better known under the *nom de plume* of Jeremias Gotthelf): 1797, Oct. 4—1854, Oct. 22; b. Morat, canton of Freiburg, Switz.: author. He was educated for the church; and after holding several cures, was appointed, 1832, pastor of Lützelflüh, in Emmenthal, canton of Bern, which office he retained till his death. His first work was *The Mirror of Peasants* (Burgsdorf, 1836), the touching history of a poor villager, Jeremias Gotthelf, which pseudonym B. ever after retained. In 1838, appeared his *Sorrows and Joys of a Schoolmaster*; in 1839, *Dursli, the Brandy-drinker*, and *How Five Maidens miserably perish in Brandy*; in 1842–46, *Scenes and Traditions of the Swiss*, 6 vols., in which B. narrates, with great art, the old national legends, among which the most remarkable is the *Reconciliation*. The best and most popular of his stories, however, are *Grandmother Katy* (Berlin, 1848); *Uli, the Farm-servant* (Berlin, 2d ed., 1850); its continuation, *Uli, the Farmer* (2d ed., Berlin, 1850); and *Stories and Pictures of Popular Life in Switzerland* (Berlin, 1851). Subsequently, he wrote several pamphlets against the extreme German democrats, without, however, violating those popular sym-

BIURET—BIVALVE SHELLS.

pathies and liberal convictions which pervade his writings, and which at an earlier period led him vehemently to oppose the family government of the Bernese aristocracy. His last work was *The Clergyman's Wife* (1854). B.'s writings are greatly relished in Switzerland. They are characterized by simplicity, inventiveness, a wonderful fidelity in the delineation of manners and habits, great vigor of description, and raciness of humor. See his *Life* by Manuel (Berl. 1857), and Brockhaus (Berl. 1876).

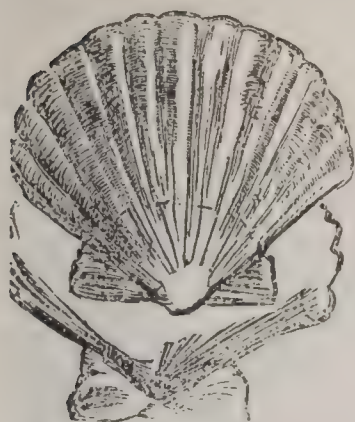
BIURET, n. *bī-ū'rēt* [*bī*, twice, and *urea*]: a chemical substance formed in the decomposition of urea.

BIVALVE, n. *bī'vālv* [F. *bivalve*—from L. *bis*, twice; *valvæ*, folding-doors]: a shell consisting of two parts which shut and open, as the mussel or oyster; in *bot.*, a seed case or vessel which consists of two parts like a mussel. **ADJ.** also **BIVAL'VULAR**, a. *-vū-ler*, and **BIVAL'VOUS**, a. *-vūs*, having two shells, as the oyster or mussel.

BI'VALVE SHELLS, or **BIVALVES**: testaceous coverings of mollusks, which consist of two concave plates or *valves*, united by a hinge. So long as molluscos animals, provided with shells, were considered by naturalists almost exclusively with respect to these, the order of Bivalve Shells, originally established by Aristotle, retained its place (see **CONCHOLOGY**); and indeed the external character upon which it is founded is closely connected with some of the important structural characters according to which mollusks are now classified. See **MOLLUSCA**. A vast majority of recent bivalve shells belong to Cuvier's *Testaceous* order of *Acephalous Mollusca*, the *Lamellibranchiate* (q.v.) *Mollusca* of Owen, although with them are classed some which were placed among *Multivalves* (q.v.) by conchologists, on account of accessory valves which they possess, and some which have a calcareous tube superadded to the true valves, or even taking their place as the chief covering of the animal. There are also animals of the class *Brachiopoda* (q.v.), or *Palliobranchiata*, which possess bivalve shells, as the *Terebratulæ*, or Lamp-shells (q.v.), etc. The structure of the shell, however, when closely examined, is found to be different in these two classes (see **SHELL**), although its general appearance is much the same. A very large proportion of the bivalve shells of the older fossiliferous rocks belong to the class *Brachiopoda*.

In the *Brachiopoda*, one valve is ventral, and the other dorsal, in the *Lamellibranchiata*, the one is applied to the right side, and the other to the left side of the animal. The valves of ordinary bivalve shells consists of layers, of which the outermost is always the smallest; and each inner one extends a little beyond it, so that the shell becomes thicker and stronger as it increases in length and breadth. The valves are connected at the hinge by an elastic ligament; and in general this consists of two parts, more or less distinct—one on the outside, to which the name *ligament* is sometimes restricted, and which is stretched by the closing of the valves; another, sometimes called the *spring*, more in

ternal, which is compressed by the closing of the valves, and tends to open them when the compressing force of the *adductor* muscle or muscles is removed, the effect of which is to be seen in the gaping of the shell when the animal is dead. The hinge is often furnished with teeth which lock into each other; sometimes it is quite destitute of them; sometimes the hinge-line is curved, sometimes straight. Conchological classification has been much founded upon characters taken from this part. The valves of some bivalve shells are equal and symmetrical, in others they are different from one another,



Pecten.
A bivalve shell.

particularly in those mollusks which, like the oyster, attach themselves permanently by one valve to some fixed substance, as a rock. Sometimes the valves of bivalve shells close completely at the pleasure of the animal; those of others always gape somewhere.

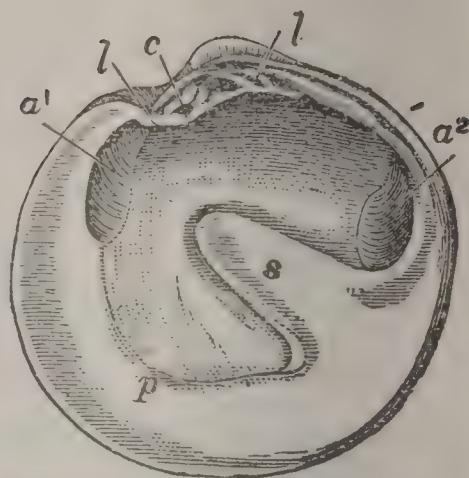
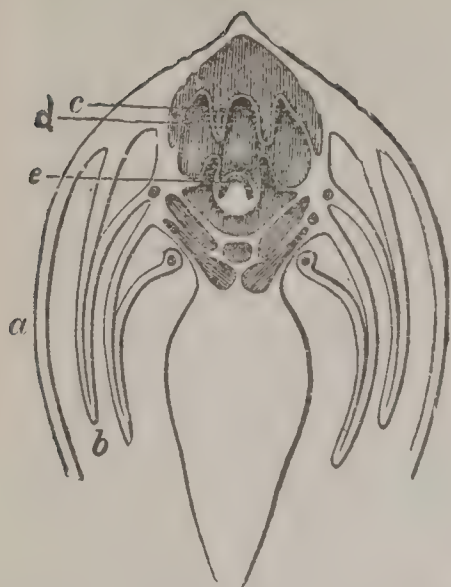
The point of the hinge, from which the formation of each valve has proceeded, is called the *umbo*. On the side of the umbo opposite to the ligament there is usually a small depression called the *lunule*. The marks, visible on the inside of a bivalve shell, are the impressions of the *mantle* of the (lamellibranchiate) mollusk, and of the adductor muscle or muscles.

BIVENTRAL, a. *bī vēn'tral* [L. *bī*, two; *venter*, belly]: in anat., having two bellies; as 'a *biventral* muscle.'

BIVIOUS, a. *bī'vī-ūs* [L. *bī*, two; *via*, way]: going in two directions.

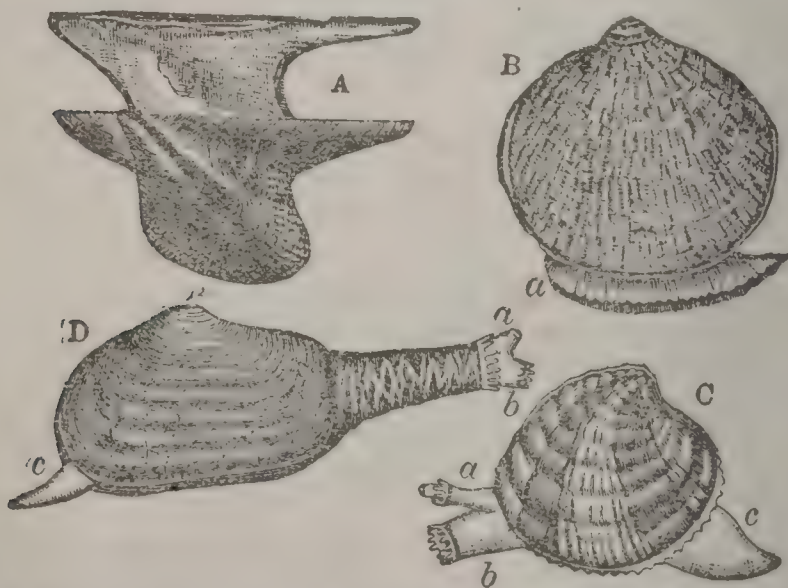
BIVOUAC, n. *bīv'wāk* [F. *bivouac*, a bivouac, guard—from Ger. *bei-wache*, an additional watch: Sp. *vivac*, town-guard]: the encampment of an army for the night in the open air, generally without tents: V. to take rest or refreshment in the open air, as an army on march, or travelers on a journey. **BIVOUACKING**, imp. **BIVOUACKED**, pp. *wākt*.

BIVOUAC: the encampment of soldiers in the open air, without tents, where every one remains dressed, and with his weapons by him. Even during the Seven Years' War it was no uncommon thing for the whole army, when in the vicinity of the enemy, to pass the night in their ranks, each lying down in his place, in order to be ready to stand to their arms at a moment's notice. But the French revolutionary armies introduced the practice of dispensing with tents altogether, and regularly passing the night *en bivouac*. Hence, in a great measure, that rapidity in their motions which long made them uniformly successful; and the practice was afterwards imitated by the other armies of Europe, though less by the English. Soldiers in B. light fires, and improvise, where it is possible, huts of straw, branches, etc. But this mode of encampment, though favorable to celerity

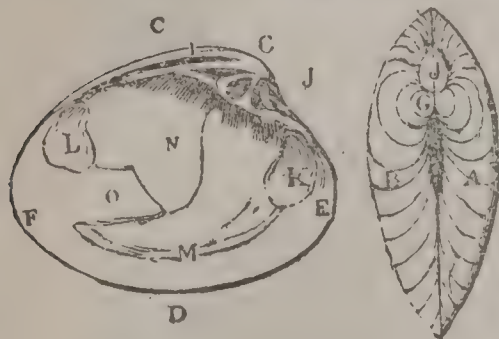


Bivalve.—Vertical Section through a Fresh-water Mussel: *a*, Mantle; *b*, Filaments of gills; *c*, Ventricle of heart; *d*, Auricle of heart; *e*, Gut grown round by ventricle.

Bivalve.—Right-valve of *Artemis Exoleta*: *a1*, The point of attachment of the anterior adductor muscle; *a2*, Do. of the posterior one; *c*, The cardinal tooth; *l, l*, The lateral teeth; *p*, The pallial impression marking where the border of the mantle was attached; *s*, The sinus.



Several Forms of Bivalves: *a*, Avicula; *B*, Pectunculus, with extended foot (*a*); *C*, Venus, with respiratory siphons (*a, b,*) and extended foot (*c*); *D*, *Mya truncata*, showing respiratory siphons (*a, b,*) and foot (*c*).



Bivalve Shell of *Cytherea Chione*: *A*, Right valve; *B*, Left valve; *AB*, Thickness; *C*, Dorsal margin; *D*, Ventral margin; *E*, Anterior side or front margin; *F*, Posterior side or hinder margin; *G*, Umbo; *H*, Hinge and hinge teeth; *o*, Cardinal tooth; *a, a*, Lateral teeth; *I*, Ligament, ligament pit or groove; *J*, Lunule; *K*, Anterior muscular impression; *L*, Posterior muscular impression; *M*, Pallial impression; *N*, Abdominal impression; *O*, Sinus; *CD*, Height or breadth; *EF*, Length.

of movement, is purchased at the expense of the soldiers' health, besides being destructive of discipline, by leading to plundering and destroying of houses, fruit trees, etc., in the vicinity. Accordingly, the tent is again coming into use, and for permanent encampments, regularly constructed, wooden huts have been introduced. There are, however, many cases where the B. is the only resource.

BIWEEKLY, a. *bī-wēk'li* [L. *bis*, twice, and *weekly*]: strictly every two weeks, or once a-fortnight—erroneously used in the sense, twice in each week.

BIXA: see ARNOTTO.

BIZARRE, a. *bī-zâr'* [F. *bizarre*, strange, capricious—from Sp. *bizarro*, valiant]: odd; fantastical. BIZZAR'RO, -zâr'rô [It.]: in *music*, strange and fantastical, as applied to the style of movement. BIZARRE', n. a variety of carnation; the *Dian'thūs caryöphyl'lus*, ord. *Car'yöphyllacēæ*.

BIZERTA, *be-zēr'tâ*, or BENZERTA, *ben-zēr'tâ* (ancient *Hippo Diarrhytus* or *Zaritus*): seaport town of Tunis, at the end of a deep gulf or bay of the Mediterranean, and at the mouth of a lagoon united to the gulf by a narrow channel. It is the most northerly town in Africa, being about 38 m. n.w. of Tunis; lat. 37° 17' n., long. 9° 51' e. Its port, formerly one of the best in the Mediterranean, has been suffered to fill up, until now only small vessels can be admitted. The fisheries of the lake are very productive, tunnies especially abounding; and much coral is obtained. Hence its importance to the French, who in 1881 made themselves masters of Tunis. Agathocles fortified B. B.C. 307; and under the Romans it was a free city. Pop. abt. 8,000.

BIZIU'RA: see MUSK DUCK.

BJÖRNSON, *be-yörn'son*, BJÖRNSTJERNE: author: 1832, Dec. 8—————; b. Qvikne, Norway; son of a Lutheran clergyman. He graduated at the Univ. of Christiania 1851, and began at once to write sketches and theatrical criticisms for the press. He also wrote *Valborg*, a play, which was accepted by the Royal Theatre, Christiania, but withdrawn by the author. In 1856 he went to Copenhagen, where he published his first book, *Synnöve Solbakken*, a tale, which gained immediate popularity, and was followed, 1858, by *Arne*, a novel. Returning to Norway, he became director of the National Theatre, Bergen; and wrote national dramas and tragedies which made a profound impression as being the first effort to create a modern Norse literature. He managed a theatre in Christiania 1863-68, making his home in that city, though traveling frequently and extensively. At about the age of 40 B. was profoundly influenced by the writings of Darwin, Mill, and others; and after 1874 he was a strong advocate of free-thought in religion, and became prominent as a liberal leader and a popular orator. He was pensioned by Norway 1892. He published *A Happy Boy* (1860); *The Fisher Maiden* (1869); also, plays—*Marie Stuart* (1863); *The Newly Married Couple* (1868); *Bankrupt* (1873); *Leonarda* (1878); *The New System* (1879); and *Songs and Lyrics* (1880); *Sigurd Slembe* (1888) *Pastor Sang* (1893).

BLAB—BLACK.

BLAB, *v.* *blāb* [Dan. *blabbre*, to babble: Ger. *plappern*, to speak confusedly or thoughtlessly, to babble: Gael. *blabaran*, a stammerer: Dut. *labben*, to tell tales]: to tattle; to tell tales; to tell secrets in a thoughtless manner: *N.* a tell-tale; one who reveals things which ought not to be told. **BLAB'BER**, *n.* *-bēr*, a tell-tale. **BLAB'ING**, *imp.* **BLABBED**, *pp.* *blābd*.

BLACK, *a.* *blāk* [Ger. *bleich*; Dut. *bleek*, pale, or bleek, which seems to be the original meaning of black: Icel. *blakkr*, bluish-gray or pale: Sw. *bläck*, ink; *blacka*, to smear with ink: Dut. *blakeren*, to scorch]: of the color of night; the opposite of white; dark; cloudy; dismal; sullen; very wicked; in compounds, **BLACK** generally means 'unlawful; wicked: *N.* name of the darkest of colors; a negro; the absence of color; mourning, as in *black*: *V.* to make black; to dirty or soil. **BLACK'ING**, *imp.*: *N.* a substance used in polishing boots and shoes; that which makes black. **BLACKED**, *pp.* *blākt*. **BLACK'ISH**, *a.* a little black. **BLACK'LY**, *ad.* *-lī*. **BLACK'NESS**, *n.* the quality of being black. **BLACKS**, *n.* *plu.* in *OE.*, and *familiarly*, the appropriate articles of dress when in mourning. **BLACK ACT**, a law which makes it felony to appear armed with the face blackened for the purpose of taking game. **B.-AMBER**, the name given by Prussian amber-diggers to jet. **B.-ART**, magic or conjuration. **B.-ASH**, impure carbonate of soda. **B.-BALL**, *v.* in *a society*, to reject a proposed member by putting *black balls* in the voting or ballot box. **B.-BALLING**, *imp.* **B.-BALLED**, *pp.* **B.-AVICED** *-ā-vist'* Scot.—from *OF.* *à vis*, to face—from *L.* *vīsus*, face: *OE.* *avise*, to look at]: in *Scot.*, dark-complexioned. **B.-BAND**, a Scotch miner's term for the iron-stones of the coal-measures which contain coaly matter sufficient for calcining the ore without the addition of coal. **B.-BERRY**, the fruit of the bramble—the *Rubus fruticosus*, ord. *Rosacēæ*. **BLACKBIRD** (*q.v.*), a species of perching-bird. **B.-BOARD**, a board painted black, used in schools for teaching purposes. **B.-BOOK**, an old book said to have been composed in 1175, containing a description of the court of exchequer, its officers, privileges, etc.; a book compiled under the authority of Henry VIII. in regard to monasteries and their abuses; a book treating on necromancy; applied to a book or a report exposing abuses. **TO BE IN ONE'S B.-BOOKS**, out of favor; in disgrace. **B.-BROWED**, *a.* applied to a person with black eyebrows; gloomy; threatening; dismal. **BLACK BRYONY**, the *Tamus*, a genus of plants belonging to the order *Smilacēæ* (*Sarsaparillas*). **BLACKCAP**, a bird so called from its black crown; an apple roasted till black; a cap put on by a judge before passing sentence of death on a criminal. **B.-CATTLE**, a general term for bulls, oxen, and cows. **B.-CHALK**, a soft black or bluish-black clay or shale found in subordinate layers in several formations—also called **ITALIAN CHALK**, **GERMAN CHALK**, etc. **BLACK-COAT**, a colloquial name for a clergyman. **B.-COCK**, the heath-cock or black grouse. **B.-CURRANTS**, the well-known small black berries of a bush common in our gardens—the *Ribes nigrum*, ord. *Grossulārīacēæ* or *Ribesēacēæ*. **B.-DEATH**, the terribly fatal

BLACK.

plague of the fourteenth century, in which the body after death rapidly became black and putrefied—said to have carried off 25 millions in Europe alone. **B. DRAUGHT**, a medicinal mixture of senna and magnesia or Epsom salts, and aromatic spirits of ammonia. **BLACK-FISH**: see that title. **BLACK FRIAR**, one of an order of monks, also called Dominicans. **BLACK GUM**, the *Nyssa multiflora*, a tree 40 to 50 feet high. Its wood, which does not easily split, is made into naves for carriage-wheels and blocks for batters. **B.-FLUX**, a mixture of carbonate of potash and charcoal, used in chemical operations. **B.-HEARTED**, having a malicious and hate bearing heart. **B.-HOLE**, a place of confinement for soldiers. **B. HOLE OF CALCUTTA**, in 1756, a dark, close cell in which Suraja Dowlah confined 146 British prisoners, only 23 remaining alive next morning when taken out. **B.-JACK**, formerly a leather cup; a miner's term for sulphuret of zinc or blende. **B.-LEAD**, a familiar name for *graphite*, from its resemblance to the metal lead, called also *plumbago*, used in making lead pencils. **B.-LEGS**, a disease among calves and sheep. **B.-LEG** a common gambler; a cheat. **B.-LETTER**, the old English alphabetic character. **B.-LIST**, a periodical published privately for the use of the mercantile and trading community, containing lists of insolvents, dishonorers of bills, etc. **B.-MAIL** [see **MAIL 2**]: a tax in money or kind paid in ouden times to robbers for protection; any tax extorted under any threat. **BLACK MONDAY**, Easter Monday; specially Easter Monday, 1351, when people perished of cold in England; also in 1360, when the cold was fatal to many of Edward III.'s soldiers besieging Paris. **B.-PUDDING**, a pudding made of blood thickened with meal. **BLACK SEA**, said to be so named from the prevailing black color of the rocks and coal-formations on certain parts of its shores. **B.-SHEEP**, an outcast; a person ill-behaved and of low habits. **B.-STRAKES**, a range of planks immediately above the wales in a ship's side covered with tar and lamp-black. **B.-THORN**, a tree very branchy, armed with strong sharp spines, and bearing small round black fruit like plums or cherries—also called the *sloe*—the *Prunus spinosa*, ord. *Rosacæ*. **BLACK-TIN**, tin ore when beaten into a black powder and washed ready for smelting. **B.-VOMIT**, one of the fatal symptoms of yellow fever. **B. WAD**, an earthy ore of manganese, usually called **WAD**, which see. **BLACK-WALNUT**: see **WALNUT**. **B. WATCH**, soldiers employed to preserve order in the Highlands, embodied as 42d Regt. in 1739. so named from the dark color of their tartan. **BLACKAMoor**, n. *blāk'ă-môr*, a negro; a black man. **BLACK AND BLUE**, the dark color of a bruise in the flesh. **BLACK AND WHITE**, in writing—that is, in black ink on white paper.

BLACK: the darkest of all colors; or, as it may be considered, the negation of color, resulting from the absorption of the rays of light by certain substances. Painters produce it by an unequal combination of the three primary colors. In mediæval art, B. was symbolical of evil, error, and woe; thus we find Christ, when the old illuminators

BLACK.

wished to represent him as wrestling against the Spirit of Evil, arrayed in black drapery; and Byzantine painters, to express the sorrow of the Virgin Mary, gave her a black complexion. 'All faces shall gather blackness,' is the expression of Joel, when he wishes to convey the idea of the trouble of the people when the calamities which, with prophetic eye, he sees brooding over Jerusalem, should come to pass. B. clothing among some oriental nations was regarded as a badge of servitude, slavery, or low birth; among the Moors, it has several significations—obscurity, grief, despair, constancy. B. in blazonry, under the name of sable, denotes constancy, wisdom, and prudence. For B. as a funeral color, see FUNERALS: MOURNING.

BLACK PIGMENTS, used in painting, are derived principally from animal and vegetable substances. They are very numerous, and of different hues and degrees of transparency; but the most important are the vegetable bleu-black—obtained from beech-wood burned in close vessels—ivory-black, cork-black, and lamp-black, the principal constituent of all being charcoal or carbon. A fine-toned black pigment is obtained by burning German or French Prussian blue. Combined with white, black pigments, which are slow driers, yield grays of several tints.

BLACK, ADAM: 1784–1874: publisher; b. and educated in Edinburgh. In 1808, having completed an apprenticeship, he commenced business for himself, and some years afterwards he took his nephew CHARLES into partnership, and they established the house of Adam and Charles Black. In 1827, the firm acquired the copyright of the Encyclopædia Britannica, and in 1851 of Walter Scott's Waverley Novels and some of his other works. Adam Black, besides holding many municipal offices, was twice elected lord provost of Edinburgh. He favored unsectarian education, absolute freedom of speech, and religious liberty.

BLACK, FRANK S.: lawyer and statesman: 1853, Mar. 8—————; b. Limington, York Co., Me.; son of Jacob B., a farmer. He was educated at Lebanon Acad. and Dartmouth College; studied law in Troy, N. Y., was admitted to the bar 1879, and elected to congress 1894. His fearlessness and legal skill in prosecution of the murderers of Robert Ross, a republican watcher at the polls on election day (1894), brought him into public notice, and made possible honest elections throughout the state. He was elected governor of N. Y. (1896) by a plurality of about 213,000.

BLACK, JEREMIAH SULLIVAN: 1810–83; eminent jurist of Scotch-Irish descent, b. Somerset co., Penn., where he also received his early education, studied law, and was admitted to the bar, 1831. From 1842 to 1851 he was presiding judge of his native county. In 1851, he was elected judge of the supreme court of Penn., and served until 1857, when he was appointed atty.gen. of the United States by Pres. Buchanan. He was a democrat of the Jeffersonian school, and when the rebellion broke out, 1860, he opposed the

BLACK.

view of Buchanan and others, that there was no authority to coerce a state, if it chose to secede. From 1860, Dec., to 1861, Mar., he was sec. of state, and endeavored to save the Union from disruption. On retiring from public life, he again entered the practice of law, and from that time until his death, which occurred at his home in York, Penn., he was engaged in a number of notable lawsuits, and wrote occasional articles for the press.

BLACK, JOHN: 1783-1855, June 25. b. Berwickshire, son of a shepherd, or farm-laborer, in the Lammermoors, near Dunse: editor. Left an orphan at twelve years of age, B. commenced his life's work in the office of a Dunse writer, which he soon left for Edinburgh, where he was engaged for several years as a writer's clerk. While thus employed B. was assiduous in self-education; and besides considerable progress made in classical studies, he acquired German from a German musician in an Edinburgh band, and Italian from a refugee. He went to London about 1810, and was immediately engaged as a parliamentary reporter for the *Morning Chronicle*, of which paper he afterwards became editor. Under his management the *Morning Chronicle* was celebrated for its independence and fearless advocacy of progress, and that at a time when subserviency was so common that it was regarded as little or no disgrace. He retired from the editorship in 1843, and continued to reside, until his death, in a pleasant cottage on the Kentish estate of one of his friends. Among those who served on the *Morning Chronicle* under Mr. Black was Charles Dickens. B. was author of a *Life of Tasso, with an Historical and Critical Account of his Writings* (2 vols. (Edin. 1810), and the translator of the lectures of the brothers Schlegel on *Dramatic Art and Literature* (since republished by Bohn), and on the *History of Literature Ancient and Modern*, as well as of one or two works from the French and Italian.

BLACK, JOHN CHARLES: soldier and lawyer: 1839, Jan. 27—————; b. Lewiston, Miss. On the death of his father the family removed to Danville, Ill., where he was a teacher and fitted himself for Wabash College. He was near the close of his junior year when Ft. Sumter was fired on, and within an hour after receipt of the news he enlisted in the 11th Ind. zouaves, subsequently recruiting for three years' service, and being commissioned maj. 37th Ill. vol. inf. 1861, Sep. He remained in the service till the close of the war, and was promoted successively lieut.-col., col., and brig.gen. for meritorious services. At Pea Ridge, Ark., 1862, Mar. 7, he was severely wounded in the right forearm, and at Prairie Grove, Ark., Dec. 7, in the left upper arm. For years he was a great sufferer from his wounds, both arms being totally disabled for manual labor, and his life being often despaired of. He was appointed the first democratic commissioner of pensions 1885, and was succeeded by James Tanner 1888, in which year he was a prominent candidate before the national democratic convention for the vice-presidential nomination.

BLACK.

BLACK, JOSEPH: 1728-99, Nov. 26; b. Bordeaux, where his father was engaged in the wine-trade: chemist. Both his parents were of Scotch descent, but natives of Belfast, to which their son was sent for his education, 1740. In 1746, he entered the Univ. of Glasgow, and studied chemistry under Dr. Cullen. In 1751, he went to Edinburgh to complete his medical course, and in 1754 took his degree. His thesis, on the nature of the causticity of lime and the alkalis, excited attention. In 1756, on the removal of Cullen to Edinburgh, B. succeeded him as prof. of anatomy (which branch he afterwards exchanged for medicine) and lecturer on chemistry in Glasgow. Between 1759 and 1763, B. evolved that theory of 'latent heat' on which his scientific fame chiefly rests, and which formed the immediate preliminary to the next great stride in discovery by his pupil and assistant, James Watt. In 1766, Cullen was appointed to the chair of theoretical medicine in Edinburgh, and B. succeeded him in the chair of chemistry. Thenceforth he labored chiefly in the elaboration of his lectures, in which he aimed at the utmost degree of perspicuity, and with perfect success. His class became one of the most popular in the university; it occasioned, however, some disappointment that one so capable of enlarging the territory of chemistry made no further contributions to that science. Though of an extremely delicate constitution, he prolonged his life, by care and temperance, to the age of 71. His lectures were published, 1803 (Edin. 2 vols. 4to), edited, with a biographical and critical preface, by Prof. Robison.

BLACK, WILLIAM: novelist: b. Glasgow, Scotland, 1841, Nov. He received a private school education; studied some time in the Glasgow School of Art; abandoned his art studies for journalism, and was employed several years on the *Glasgow Weekly Citizen*. He removed to London and began writing for the magazines 1864; was a special correspondent for the *London Morning Star* in the Prusso-Austrian war 1866; and in 1867 published his first novel, *Love or Marriage*, founded on incidents in that war. After serving as asst. editor of the *London Daily News* four or five years, he gave up journalism, and has since applied himself wholly to writing fiction. His published works include, beside the above, *In Silk Attire* (1869); *Kilmeny*; *The Monarch of Mincing Lane*; *A Daughter of Heth* (1871); *The Strange Adventures of a Phaeton* (1872); *A Princess of Thule* (1873); *The Maid of Killeena and Other Stories* (1874); *Three Feathers* (1875); *Madcap Violet* (1876); *Green Pastures and Piccadilly* (1877); *MacLeod of Dare* (1878); *White Wings: A Yachting Romance* (1880); *Sunrise: A Story of These Times* (1881); *The Beautiful Wretch* (1882); *Shandon Bells* (1883); *White Heather* (1886); *Sabrina Zembra*; *The Four Macnichols*; *Yolande*; *The Strange Adventure of a House-Boat* (1889); and *Prince Fortunatus* (1890); *Stand Fast, Craig Royston* (1890); *Wolfenberg* (1891); *Donald Ross of Heimra* (1891); *The Magic Ink, and Other Stories* (1892). D. 1898, Dec. 10.

BLACK ACTS—BLACKBERRY.

BLACK ACTS: the acts of the Scottish parliament of the first five Jameses, of Queen Mary's reign, and of James VI. to 1586; so called because printed in the black or Saxon characters. Black Act denotes also an Eng. law passed 1723 against outrages committed by persons with faces blackened or disguised.

BLACK ART: see **MAGIC**.

BLACK ASSIZE: popular name commemorative of an extraordinary and fatal pestilence in Oxford, Eng., and vicinity, 1577, July 6—Aug. 12, at the close of the assizes; popularly interpreted as a divine judgment on the cruelty of a sentence by the court. Among the 510 persons said to have died, were the chief officials on the assize, most of the jury, and many members of the university.

BLACK'-BAND IRONSTONE: ore of iron in Scotland and elsewhere, in bands in the carboniferous system; mainly a carbonate of iron with much coaly matter.

BLACK BASS: a fresh-water fish, of genus *Micropterus*; body oblong, dorsal fin low, especially in its spinous part, and with its soft part longer than the anal fin; color dark, with three dark stripes obliquely crossing the cheeks. One species, the large-mouthed (*M. salmoides*); is found from Canada and the great lakes to Fla. and Tex.: another (*M. dolomieu*) from the great lakes s. to S. C. and Ark. Both are game-fish and are esteemed for food—the small-mouthed being usually preferred by anglers, and in some localities known alone as the B. B.—The name is applied locally to the black sea-bass of the Atlantic coast, and to the black rock-fish of the Pacific coast.

BLACK BEETLE: see **BLAPS: COCKROACH**.

BLACK'BERRY, *blāk'bĕr-rĭ* (*Rubus*): fruit-bearing plant common in most parts of the world. It was formerly described in books, and is still widely known, especially in England, as the Bramble (q.v.). Among the species native to the United States are the Common or High B. (*R. villosus*), hairy and glandular, except upper surface of leaves, but with smoother and trailing varieties; the Low B. or Dew-berry (*R. Canadensis*), slightly prickly, and ripening fruit in May; the Running Swamp-B. (*R. hipidus*), beset with small prickles, and the scanty fruit red or purple, and sour; the Sand B. (*R. cuneifolius*), leaves woolly beneath; the Low Bush-B. of the south (*R. trivialis*); and (*R. spectabilis*), which has smooth stems and purple flowers, and is found in the n.w. portion of the country. Except in the United States the B. has been little cultivated, and no sorts of special excellence have been imported. By cultivation, and careful selection of plants, the size of the fruit has been greatly increased, its quality improved, and its period of ripening lengthened. Most of our cultivated sorts have sprung from *R. villosus*. They vary greatly in hardiness and productiveness, and in color range from a deep black, through intermediate shades, to a yellowish white. By proper choice of varieties the B. can

BLACKBIRD.

be grown in any part of the country, and the fruiting season can be extended from the middle of July to nearly the last of Sep. Propagation is effected naturally by suckers from the roots, or artificially by root cuttings. The former are often used, but much better plants can be secured by the latter method. Plants may be set either in fall or in spring, but in most localities the fall is preferable. The B. can be grown on almost any kind of soil, but yields the best crops when planted on a moist and moderately fertile loam. On low, rich land there is an excessive growth of canes (the ends of which are liable to be winter-killed), with a small yield of fruit; but these evils can be mitigated by severe pruning. In sandy soils properly fertilized, heavy mulching in June and July will often cause the production of a fair crop of very fine fruit. A plantation started from vigorous stock and properly cared for should come into bearing the second season and continue fruitful at least 15 years. If neglected, the plants will form an impenetrable hedge and produce little fruit. The plants need more room, but the methods of setting, pruning, and cultivating are similar to those required for the Raspberry (q.v). Though very hardy in its natural state, the cultivated B. is sometimes attacked by rust. When this disease appears, all affected canes should be promptly cut and burned. At the n. many varieties need protection in an ordinary winter, and in very severe seasons even the so-called 'iron-clad' sorts are benefited thereby. This can best be given (after loosening the roots with a strong fork or by pulling the canes), by bending over the plants and covering the tops with soil. Where very much covering is required most of the earth can be turned on with a plow. See RUBUS.

BLACK BIRD: general name in N. Amer. for the most of the family *Icteridæ*, but coupled with some conventional descriptive name. It is applied not to two of the sub-families, the Meadow Larks and the Orioles, but rather to the other two here occurring, the Marsh Blackbirds (*Agelaiinæ*) and the Crow Blackbirds (*Quiscalinæ*). Of the first division is the BOBOLINK, known as the Reed-bird in the middle states, the Rice-bird in the s. states, the Butter-bird in the W. Indies and S. Amer., but sometimes called the Skunk B. from its colors; also the Cow B., or Cow-bird; the RED-WINGED B., sometimes known simply as the B.; and the YELLOW-HEADED B., mostly w. The Red-winged B. visits all parts of N. America, arriving in the n.e. states usually about Apr. 1. —The Crow B. group includes the Thrush B., or Rusty Grackle, n. United States and n. to Alaska; Brewer's B., or the Blue-headed Grackle, w., and w. to the Pacific; the Fan-tailed Crow B., or Texas Grackle; the Boat-tailed Crow B., or Jackdaw, s.; the Purple or Common Crow B.; the Bronzed Crow B., or Brass Grackle, far n., and Rocky Mts., and Gulf states; and the Florida Crow B., or Green Grackle. The long tails of these birds have the peculiarity in flying of slanting up on each side, so as to form a boat-like keel. The

BLACK-BULLY—BLACKBURN.

males of all the species are black, but beautifully iridescent with metallic colors. They form a transition to the *Corvidæ*, or crows proper and jays.—The B. of Britain (*Turdus* or *Merula vulgaris*) is a single species, belonging to another family, the Thrushes (*Turdidæ*), which includes our robins and thrushes. It is common throughout Europe, and is found in n. Africa and the Azores, but in Asia it gives place to a closely related species (*T. pæcilopterus*). The male is wholly of deep black color, but the female, like some of our blackbirds, is brown. It frequents hedges, thickets, and woods; and is shy, keeping much under cover of shrubs and evergreens, thus differing greatly from our various species of B., while it agrees with our robin in its troublesome fondness for fruit. The voice of this B. is very powerful, and its song more mellow than that of the foreign thrush, but with much less variety, compass, and execution. It is often kept as a cage-bird, notwithstanding the excessive loudness of its notes; and it shows, under training, considerable power of imitation even of spoken words. The songs of our groups of B. are not to be expected to rival those of thrushes, yet the very musical whistling of the Baltimore oriole, and the liquid gurgle of the bobolink, maintain the vocal right of the family to a place among Oscines. The most of the species of B. are helpful to the farmer and gardener; the Red-winged B., however, collects in immense flocks in the fall and invades southern grain-fields.—The SAVANNA B. of the W. Indies belongs to another family.

BLACK-BULLY, or BALLY-TREE WOOD (*Acêras sapota*): South American tree, belonging to the nat. ord. *Sapotaceæ*. Its wood, which is greenish and very durable, is used for ship-building. The bark is febrifugal, while the seeds are diuretic and aperient.

BLACK'BURN: inland town of Lancashire, Eng., 21 m. n.n.w. from Manchester, 12½ m. by railway e. by s. from Preston. It stands on a stream, from which it appears to derive its name, a branch of the Ribble. The surrounding district, formerly known as *Blackburnshire*, or *Blagbornshire*, was long very wild and dreary, but is now very populous. Coal and lime abound in it. B. had acquired some importance as a market-town in the 16th c. Its manufacturing prosperity can be traced back at least to the middle of the 17th c., when it was noted for the production of a kind of linsey-woolsey known by the name of *Blackburn Checks*, afterwards superseded by the *Blackburn Grays*, so called from their being printed unbleached. In the 18th c., the cotton manufacture became the chief industry of the town, which is now one of its chief seats, the number of cotton factories being very large, many of them employing 1,000–2,000 operatives. The value of the calicoes and other cotton goods annually produced was estimated some years ago at nearly £2,000,000 sterling, and is now certainly much more. The steam-power employed in the works for spinning and weaving cotton has been more than

BLACKBURNE—BLACKCAP.

doubled within the last twenty years. Many improvements in machinery for the cotton manufacture have been made in B., among which the first place in importance as well as in date must be assigned to the invention of the spinning-jenny, 1767, by James Hargreaves (q.v.), native of the town. His invention, however, was regarded with so much dislike, that he was compelled to remove from the town, and it was not till the beginning of the present c. that it came into general use. There is a *Corporation Park* of 50 acres, part of which is 700 ft. above the level of the sea, and commands a very extensive view. The parish church is a beautiful Gothic building. The grammar-school was founded by Queen Elizabeth, 1567. The finest building is the Exchange, built 1865; the town-hall is also worthy of mention. B. sends two members to parliament. Pop. (1851) 46,536; (1861) 63,126. Pop. of municipal borough (1871) 76,339; of parliamentary borough, 82,928; (1881) 104,012 and 100,618, respectively; (1901) 127,527.

BLACK'BURNE, FRANCIS, Lord Chancellor of Ireland: 1782, Nov. 11—1867, Sep. 17; b. Great Footstown, county Meath, Ireland. In 1798, he entered Trinity College, Dublin. Called to the English bar 1805, to the Irish 1822, he was appointed attorney-gen. for Ireland 1830 and again 1841, master of the rolls 1842, chief-justice of the queen's bench 1846, and lord chancellor of Ireland 1852 and 1866. He thus served under both whig and tory governments, and was brought into close connection with the leading politicians on either side; while at different times he had the duties imposed on him of prosecuting O'Connell and judging Smith O'Brien. In 1867, he declined an offer of a baronetcy, and for some years he was vice-chancellor of Dublin Univ. See the Life by his son (1874).

BLACK'CAP, or BLACKCAP WAR'BLER, or BLACKCAP FAUVETTE' (*Curruca atricapilla*): a bird of the great family of the *Sylviadæ*, or Warblers, and of the same genus to



Blackcap (*Curruca atricapilla*).

which the nightingale is commonly referred: see FAUVETTE; WARBLER; SYLVIADÆ. It is regarded as the

BLACKCAP TITMOUSE—BLACKCOCK.

sweetest song-bird in Europe, except the nightingale, to which it is said to be even superior in 'its shake or trilling note.' Very often, however, the strain is desultory, and of short continuance; but it is loud, rich in tone, and has a 'great variety of sweet and gentle modulations.' White says, in his *Natural History of Selborne*, that while the B. warbles, its throat is wonderfully distended. It is a rather smaller bird than the nightingale; the female is larger than the male. The back, wings, and tail are of an ash-brown color; the chin, throat, and breast are gray; the belly, white. The upper part of the head in the male is jet-black; in the female, of a dull rust color. The feathers of the head, both in the male and female, are somewhat erected, giving the bird a hooded appearance, on account of which it is called, in Germany *the monk*.—To the same family, and of the sub-family Fly-catching Warblers (*Setophaginæ*), belongs the BLACK-CAPPED WARBLER of N. Amer. (*Myiodioides pusillus*); bright yellow, deeper below, shaded on the sides with olive.—The BLACK-CAPPED GNAT-CATCHER belongs to the family *Turdidæ*; it is like the blue-gray species, except the black extends beyond the forehead over the head; below white, wings brown, tail black; Tex. and s. Cal.—The BLACK-CAPPED GREENLET, family of *Vireos*, is olive, beneath white-wings and tail dark; found in Tex. and Mexico; rare. There is also a BLACK-CAPPED PETREL, long-winged sea-bird, casual on the Atlantic coast.

BLACK'CAP TITMOUSE, or CHICKADEE': N. American bird: see TITMOUSE. The Marsh Titmouse, a British bird, is sometimes called Blackcap, or Blackcap Titmouse.

BLACK CHALK: a variety of Clay-slate (q.v.) containing a considerable proportion of carbon. It is used in drawing, and is also ground down to form a black paint. It is found as a rock of a slaty texture and a bluish-black color in the island of Islay and in Caernarvonshire, also in Spain, and other parts of the world.

BLACK'COCK, or HEATH'-FOWL, or BLACK GROUSE (*Tetrao Tetrix*): species of Grouse (q.v.), abundant in Britain wherever there are moors of considerable extent, particularly where there are bogs and morasses with rank herbage, or, adjacent to the moors, natural woods or young plantations of pine and fir. Comparatively rare in the s. of England, the B. is more common towards the n., and is very plentiful in the mountainous parts of Scotland. It is found in some of the Hebrides, but not in the Orkney or Shetland Isles. On the continent of Europe, it occurs both in mountainous and marshy countries, as on the Alps and in Holland; it is found as far s. as the Apennines, and as far n. as the forests of Lapland, it abounds in Scandinavia, where it is carefully protected, the males only being killed, great numbers of which are sent to the London market; it is diffused over almost all Russia, and is found in Siberia. The male is much larger than the female, sometimes weighing as much as four pounds, while the female weighs only about two pounds; they

BLACKCOCK.

also differ very much in plumage. The male is of a shining bluish-black color, with a conspicuous white bar on the wings below the ends of the great wing-coverts, and a mixture of black and white on the legs; there is a piece of bare scarlet skin over the eye; the outer feathers on each side of the tail are elongated and curve outwards, giving it a very peculiar appearance. The female, called the *Gray Hen*, is of a rust color, darkest on the upper



Blackcock (*Tetrao Tetrix*).

parts, everywhere barred and mottled with a darker color; the tail is straight and even at the end. The young males resemble the females in plumage. The shank in this species is feathered, but not the toes. It is a gregarious bird, the different sexes, however, in winter, generally keeping in flocks by themselves. In spring, the males resort to elevated and open spots, where they crow, and also make a sound which has been likened to the whetting of a scythe, thus inviting the females to repair to them; they strut and trail their wings like turkey-cocks, and fierce contests often take place among them. They are polygamous, and pay no attention to the females during incubation, nor do they take any part in rearing the young.—The nest is of the simplest construction, a few straws or the like, placed together among tall heath, or under the shelter of a low thick bush. The eggs, six to eight in number, are yellowish-white, speckled with orange-brown, and about two inches long. The food of the B. consists of the seeds of rushes and other plants, berries, insects, the tender shoots of heath, leaves, etc.; it sometimes visits cornfields and stubbles to feed on corn; is frequently to be found in turnip-fields in the neighborhood of plantations in hilly districts; and, at least in winter, eats the young shoots of pines, firs, birches, and alders. It is highly esteemed for the table. For the Pinnated Grouse, or Prairie Hen of N. America, a bird rather smaller than the B., see GROUSE.

It seems to be well established that hybrids are occa-

BLACKCOCK—BLACK COUNTRY.

sionally produced between the B. and other species of grouse; and also between the B. and the pheasant; but this subject, although regarded with much interest by some of the greatest naturalists, has not yet received requisite investigation, and nothing appears to be known concerning any offspring of such hybrids. See Yarrell's *British Birds*, ii. 289–314. It can be deemed only probable, not certain, that the bird called *Tetrao hybridus*, sometimes found in the Scandinavian peninsula and other parts of Europe, is a hybrid between the B. and the Capercailzie (q.v.).

BLACK COPPER, n. [named from its being a copper ore of a bluish or brownish-black or black color]: a mineral, called also Melanconite.

BLACK CORN: book-name for *Melanopyrum*, of which it is a translation. It is the French *blé* [*noir noir*, black, and *blé*, corn, wheat]. It is called also Black Wheat.

BLACK COUCH: name of a plant, *Alopecurus agrestis* (q.v.).

BLACK COUNTRY: those sections of the midland district of England which, being almost deprived of verdure by the coal and iron industries, are, so to say, blackened by them.

BLACK DEATH.

BLACK DEATH: one of the names given to an oriental plague marked by inflammatory boils and tumors, which in the 14th c. desolated the world. It took this name from the black spots, symptomatic of a putrid decomposition, which, at one of its stages, appeared upon the skin.

Information as to the symptoms and course of this terrible malady is far from perfect. So much is clear, that they varied somewhat from case to case, and in different countries, and greatly changed towards the close of the period of its ravages in Europe (1348-51). Among them may be noticed great imposthumes on the thighs and arms—called buboes—and smaller boils on the arms and face; in many cases, black spots all over the body; and in some, affection of the head, stupor, and palsy of the tongue, which became black as if suffused with blood; burning and unslakable thirst; putrid inflammation of the lungs, attended by acute pains in the chest, the expectoration of blood, and a fetid pestiferous breath. On the first appearance of the plague in Europe, fever, the evacuation of blood, and carbuncular affection of the lungs, brought death before the other symptoms could be developed; afterwards, boils, and buboes characterized its fatal course in Europe as in the East. In almost all cases its victims perished in two or three days after being attacked. Its spots and tumors were the seals of a doom which medicine had no power to avert, and which in despair many anticipated by self-slaughter.

The history of the rise and progress of the B. D. is more obscure than its symptoms and its course. But while fable enters largely into its history, it seems safe to assign its birthplace to China; and there is a strong concurrence of testimony, that the causes which co-operated to produce it are to be sought as far back as 1333—15 years before its outbreak in Europe—in a series of great convulsions of the earth's structure, which commenced in that year, and for 26 years continued powerfully to affect the conditions of animal and vegetable life. The precise date of the appearance of the plague in China is unknown, but from 1333-48, that great country suffered terrible mortality from droughts, famines, floods, and earthquakes which swallowed mountains, and from swarms of innumerable locusts; and in the last few years of that period, from the plague. During the same time, Europe manifested sympathy with the changes which affected the East. The order of the seasons seems at various times to be inverted; storms of thunder and lightning were frequent in the dead of winter, and there occurred great earthquakes and eruptions of volcanoes supposed extinct. The theory is, that this great tellurian activity, accompanied by the decomposition of vast organic masses, myriads of bodies of men, brutes, and locusts, produced some change in the atmosphere unfavorable to life; and some writers, speaking of the established progress of the plague from East to West, say that the impure air was actually visible, as it approached with its burden of death. 'A dense and awful

BLACK DEATH.

fog was seen in the heavens, rising in the East, and descending upon Italy' (*Mansfeld Chronicle in Cyriac Spangenberg*, chap. 287, fol. 336). With this view of the plague is to be conjoined another regarding the causes which produced a predisposition of the inhabitants of Europe to become its victims, and which are referred to the effects on the popular health partly of scarcity, and partly of the prevalent bad habits of living. There is much probability in the theory that the plague was owing to an atmospheric poison acting on the organs of respiration, which, it will be recollected, were always those first attacked. But while impurity of the air and the state of the public health may have largely contributed to the mortality, it may be doubted whether the disease did not owe its extension almost wholly to infection and contagion, whatever causes may have originally produced it. It appears that the pestilence had in a milder form appeared in Europe, 1342, but it had passed away, and there is little reason for holding that, in the interval, it remained merely latent. The invasion of 1348 may actually be tracked from China in its advance by the various caravan routes towards the West. The n. coast of the Black Sea sent the plague by contagion to Constantinople. By contagion it reached the seaports of Italy, and thence, as from so many foci of contagion, it soon established itself over Europe. Its advance may be traced through Germany and France to England, from which it was transmitted to Sweden. It was three years from its appearance at Constantinople, before it crept, by a great circle, to the Russian territories. This fact of its spread by contagion has led to speculations as to whether, by rigid rules of quarantine, it might not have been excluded from Europe. Such rules are now at many points in force as securities against oriental plagues.

There are no proper materials for estimating the mortality which this plague produced, for it occurred before the value of statistics was appreciated. But in China, 13,000,000 are said to have died, and in the rest of the East nearly 24,000,000. These numbers appal the imagination. Coming to Europe, the horror is increased by the greater exactness of the details. London alone lost over 100,000 souls; 15 European cities lost among them about 300,000; Germany is calculated to have lost 1,244,434; Italy, one-half of its population. On a moderate calculation, it may be assumed that during its three years' rage there perished in Europe 25,000 000 human beings. Africa suffered with the rest of the known world. Everywhere was death. All animal life was threatened. Rivers were consecrated to receive corpses, for which none dared perform the rites of burial, and which in other places were cast in thousands into huge pits made for their reception. Death was on the sea, too, as well as on the land, and the imagination is quickened to the realization of the terrible mortality by accounts of ships without crews—the crews dead and putrefying on the decks of the aimless hulls—drifting through the Mediterranean, the Black and the North Seas.

BLACK DEATH.

and cursing with the contagion the shores on which winds or the tide chanced to cast them.

The mortality caused by the plague was, however, only one of the evils to which it gave rise. Its moral effects on the survivors and the frame of society were no less momentous. Many died of fear, which among the living dissolved the ties of kindred; mothers forsook their plague stricken children; the worldly became quickened to a maddening sense of sin; the religious fixed their eyes more steadily on futurity; all rushed to sacrifice their means to the church, while the ecclesiastics drew back from the gold showered over their walls, as being tainted with death. Superstition finally banded multitudes together by common means to work out the common safety. In Hungary, and afterwards in Germany, rose the brotherhood of the Flagellants, who undertook to expiate the sins of the people, and avert the pestilence by self-imposed sufferings. Originally of the lower classes, they gathered to their order, as it extended, crowds of the highest, both men and women, and marched from city to city, robed in sombre garments, with red crosses on the breast, back, and cap, and with their heads covered as far as the eyes; they went chanting in solemn processions with banners, with down-turned faces, and bearing triple scourges with points of iron, with which, at stated times, they lacerated their bodies. They at last pervaded nearly all Europe; Germany, Hungary, Poland, Bohemia, Silesia, and Flanders did them homage. See FLAGELLANTS. Suffice it that the order was not suppressed till the pope, at the instigation of several crowned heads, prohibited throughout Christendom their pilgrimages, on pain of excommunication. While the wanderings of the Flagellants threw society into confusion, and helped to spread the plague, the horrors of the time were further heightened by the fearful persecutions to which the Jews were subjected, from a popular belief that the pestilence was owing to their poisoning the public wells. The people rose to exterminate the Hebrew race, of whom, in Mayence alone, 12,000 were cruelly murdered. They were killed by fire and by torture wherever they could be found, and for them to the terrors of the plague were added those of a populace everywhere infuriated against them. In some places, the Jewish people immolated themselves in masses; in others, not a soul of them survived the assaults of their enemies. No adequate notion can be conveyed of these horrors. To aggravate the pestilence, the poison-panic made the people shut up their wells. With terror of poison and of plague in a state of society rude at the best, but then further disorganized, such means as were available to mitigate or prevent the sufferings of the people were rendered altogether nugatory.

It would be useless to attempt to give any notion of the effects on society of this plague; how during it some, like people in sieges, came to be callous, and some, like thieves under the gallows, to regard the desolation only as it afforded opportunities for plunder and indulgence. The whole phenomena would form a fine study for the social philosopher and psychologist. We must content ourselves

BLACK DUCK—BLACK FOREST.

here with referring the reader to the *Decameron* of Boccaccio for a description of the plague at Florence, which, for vividness and particularity of observation, almost equals Thucydides's account of the plague at Athens. In Bulwer's *Rienzi*, also, an account of the plague will be found. The reader should also consult Hecker's *Epidemics of the Middle Ages*, translated for the Sydenham Soc. Accounts of the plague have been left us by the physicians Guy de Chauliac and Chalin de Vinario. But perhaps Boccaccio's is the best of the whole. The B. D. afterwards more than once appeared in Europe, but never with the same virulence or duration.

BLACK DUCK: see **DUCK**.

BLACKEN, v. *blāk'n* [from **BLACK**]: to make black; to soil; to defame. **BLACKENING**, imp. *blāk'n'ing*. **BLACK'ENED**, pp. *-ēnd*. **BLACKENER**, n. *blāk'nēr*, one who. **BLACKING**, n.: see under **BLACK**.

BLACK FISH: name variously applied; often to a species of the mammalian dolphin and porpoise family, the *Globicephalus intermedius* of the Atlantic coast; ordinarily 15–18 ft. in length, and yielding from 10 gals. to 10 bbls. of oil, worth \$5 to \$40. They swim in large schools, at times several hundred, and, if not self-stranded, are often driven inshore by fishermen, and captured. They feed on schools of valuable food-fish. Another species is found on the Pacific coast (*G. Scammonii*), formerly abundant off Lower Cal.—The B. or **TAUTOG** (*Tautoga onitis*), an esteemed food-fish, especially in New York, ranges from New Brunswick to S. C., and is known s. as the Moll, Will George, Saltwater Chub, and Oyster-fish, in different localities. New York markets annually about 100 tons of this fish.

BLACK FLUX: mixture used in chemical operations. It is prepared by heating in a covered crucible ordinary or crude cream of tartar, or the bitartrate of potash ($\text{KHC}_4\text{H}_4\text{O}_6$), when the tartaric acid ($\text{H}_2\text{C}_4\text{H}_4\text{O}_6$) is decomposed and charred, forming carbonic acid (CO_2), which remains in combination with the potash as carbonate of potash (K_2CO_3), accompanied by much free carbon. This intimate mixture of carbonate of potash and carbon, called B. F., is a fine black powder of great service in the fluxing of metallic ores, as of lead (q.v.), and the separation of the metal therefrom. The B. F. is likewise used as the raw material from which, on the application of heat in iron vessels, the metal potassium can be obtained.

BLACK FOREST (Ger. *Schwarzwald*): wooded mountain-chain in Baden and Würtemberg running from s. to n. along the w. side of Swabia, parallel with the course of the Rhine after its great bend near Basel, and often only a few m. from it. The Rhine also bounds it on the s. and the level country between the Enz and the confluence of the Neckar with the Rhine borders it on the n.; lat. 47° 30'–49° 30' n., long. 7° 40'–9° e. The chief rivers rising in the B. F. are the Danube, Neckar, Murg, Kinzig, Elz, Enz, and Wiessen. The B. F. attains

BLACK FRIARS--BLACK HAWK.

its greatest elevation in the bare and round-topped Feldberg (about 4,903 ft. high), near the source of the Wiessen and the celebrated Hölle (Hell) Pass, a narrow valley shut in by mountains in the vicinity of Neustadt. The great mass called the Kaiserstuhl (Emperor's Chair), near Breisach, is quite isolated. As to the geological character of the B. F., primitive granite and gneiss form its core, porphyry is found on its sides, and sandstone along its highest ridges, as well as at its base. Silver, copper, cobalt, lead, and iron are found in greater or less quantity in its principal chain, which is luxuriantly wooded, its name Schwarzwald being derived from the dark-tinted foliage and immense number of its fir-trees. The B. F. is also rich in mineral waters, as, e.g., the baths of Baden-Baden and Wildbad (q.v.). On the Rhine side, the descent is precipitous, but towards the Danube and the Neckar it is gradual. Among its numerous valleys, the Murgthal is most famous for its natural beauties. The w. slopes are studded with vineyards. Summer rye, oats, and potatoes are cultivated in some parts of the B. F.; but it is with difficulty, and the rearing of cattle is prosecuted with much greater success. This, and the manufacture of articles of wood, are the chief industry of the inhabitants. The making of wooden clocks and other time-pieces employs about 40,000 persons; and not less than 600,000 articles of this kind, including music-boxes, are exported annually to all parts of the world.

Two of the passes of the B. F., the Kniebis and the Hölle, acquired considerable celebrity during the wars of the French Revolution. The first, on the borders between Baden and Württemberg, was taken by the French, 1796 and 1797; the Hölle is known in connection with Moreau's retreat, 1796. See Séguin's *B. F.: its People and Legends* (1879).

BLACK FRIARS: see DOMINICANS.

BLACK FRIDAY: see PANIC.

BLACKGUARD, n. *blåg'gárd* [*black*, in reference to their dirty work, and *guard*: but. F. *blagueur*, an insolent braggart—from *blague*, loud, abusive talk: comp. Gael. *blugair*, an impudent boaster]: a name originally given in derision to the lowest class of menials or hangers-on about a court or great household; a mean, low fellow; one who uses foul language; a scoundrel: V. to defame; to employ foul or abusive language in speaking of any one. **BLACKGUARDING**, imp. **BLACKGUARDED**, pp. *blåg'er-dăd*. **BLACKGUARDISM**, n. *-izm*, the conduct or language of a blackguard.

BLACK GUM TREE: see TUPELO.

BLACK HAWK; 1767-1838: famous chief of the Sac and Fox Indian tribes: b. Kaskaskia, Ill. At the age of 15 he joined the ranks of the braves. He became chief of his tribe (the Sacs), on the death of his father, about 1788. In 1804 the Sacs and Foxes sold their land, extending 700 m. along the Mississippi, to the United States in consideration of an annuity of \$1,000. Black Hawk repudiated this

BLACKHEATH—BLACK HOLE.

treaty, claiming that the chiefs were drunk when they signed it, and in the war of 1812 he joined the English army with 500 warriors. Defeated and forced to ratify the treaty, he still remained inflexible in his resolution to retain possession, with his tribe, of the homes of their ancestors. When compelled to leave, in 1831, he again resorted to war and massacre, was completely overwhelmed at the river Bad Axe, 1832, Aug. 1, 2, and surrendered Aug. 27. He, his two sons, and seven other braves were taken as hostages, carried as a show through our principal cities, and then confined at Fortress Monroe until 1833, June 5. He died in his camp on the Des Moines river.

BLACKHEATH: a high-lying open common, in the county of Kent, Eng., five m. s.e. of London, near Greenwich Park. It commands a fine view of great extent, and being a healthy tract, many villas have been built on its margin. It is a favorite holiday resort for Londoners. The Roman road to Dover crossed it. B. is one of the few places in England where the ancient Scottish game of golf is practiced. On it stands Morden College, founded 1695 by Sir J. Morden for decayed merchants, and with a revenue of £5,000. B. was formerly the scene of several insurrections, including those of Wat Tyler, 1381, and Jack Cade, 1450. Here the Danes encamped, 1011; the Londoners welcomed Henry V. from Agincourt; and Charles II., on his way from Dover, met the army of the Restoration. See Dr. Drake's *History of the Hundred of Blackheath* (1886).

BLACK HILLS: mountainous region in s.w. South Dakota, extending into the e. part of Wyoming; long. 103° to 105°. It was purchased from the Indians in 1876, for whom it had been one of the finest hunting grounds in the west. In 1877-8, thousands of miners went there, and in 1880 there had already sprung into existence three towns, viz. Deadwood, pop. (1900) 3,498; Lead City, pop. (1900) 6,210; and Central City (since abandoned). Considerable deposits of tin were found in the B. H., chiefly in Custer and Pennington cos., S. D., 1882, and the Harney Peak mines became conspicuous in the presidential campaign 1892. The region is also rich in copper, lead, iron, and mica. Thrifty farmers have settled there, and many of them have good farms and fine improvements. Good school-houses have also been built in different settlements. The gold product in 1893 was \$4,098,500 from 43 mines and the total from 1878 to date over \$50,000,000.—See **SOUTH DAKOTA: WYOMING.**

BLACK HOLE: appellation familiarly given to a dungeon or dark cell in a prison; associated with a horrible catastrophe in the history of British India—the confinement of a party of English in an apartment called the 'Black Hole of Calcutta,' on the night of 1756, June 18. The garrison of the fort connected with the English factory at Calcutta, having been captured by the nabob Suraja Dowlah, this barbarian caused the whole of the prisoners, 146 in number, to be confined in an apartment 20 ft. square. This cell had only two small windows, and these were

BLACKING—BLACK LETTER.

obstructed by a veranda. The crush of the unhappy sufferers was dreadful; and after a night of excruciating agony from pressure, heat, thirst, and want of air, there were in the morning only 23 survivors, the ghastliest of living forms. See INDIA.

BLACKIE, *blak'ē*, JOHN STUART: Scottish philologist and philosopher: 1809, July—1895, Mar. 2; b. Glasgow. He was educated at Aberdeen and Edinburgh; then for 2 years studied philology in Göttingen, Berlin, and Rome; was prof. of Lat. literature at Aberdeen 1841–52, and then of Greek at Edinburgh till 1882. The wide range of his studies is indicated by the following partial list of his writings: *Pronunciation of Greek* (1852); *Discourse on Beauty* (1858); *Songs and Legends of Anc. Greece* (1857); *War Songs of the Germans* (1870); *Self Culture* (1874); *Natural Hist. of Atheism* (1877); *Wisdom of Goethe* (1883); *The Land Laws* (1885), favoring 'the land for the people'; *The Scottish Highlanders* (1885); *Life of Robert Burns* (1887); *Essays on Subjects of Moral and Social Interest* (1892), giving his conclusions on education, religion, politics, etc. B. presided at the meeting of the Pan-Presb. Alliance at Toronto 1892.

BLACK JACK: name given by miners to Blende (q.v.). Also, name in former times for a kind of drinking flagon.

BLACK JACK, or **NIGGER CATERPILLAR**: see **TUR NIP SAWFLY**.

BLACK JACK TREE: see **OAK**.

BLACK LEAD, or **GRAPH'ITE**, or **PLUMBA'GO**: a mineral consisting chiefly of carbon, but containing also more or less of alumina, silica, lime, iron, etc., to the extent of 1 to 47 per cent., apparently mixed rather than chemically combined. B. L. is the popular name, and that by which it is generally known in the arts; graphite is that generally preferred by mineralogists.—The name B. L. seems unfortunate, as no lead enters into the composition of the mineral. It sometimes occurs crystallized in short imbedded hexagonal prisms; but generally massive, and more or less radiated, foliated, scaly, or compact. It is of a grayish-black color, with a somewhat metallic lustre, and is perfectly opaque. It is greasy to the touch, and is a perfect conductor of electricity. It is found in primary and transition rocks, as in gneiss, mica-slate, quartz-rock, greenstone, and clay-slate, and somewhat abundantly in various parts of the world. It is so far incombustible that it burns with much difficulty even before the blow-pipe, on which account it is much used for the manufacture of crucibles or 'melting-pots,' which withstand great heat. These are not, however, made of mere B. L., but of B. L. in powder, mixed with half its weight of clay. B. L. is employed for making pencils (q.v.). It is also extensively used to give a black gloss to iron grates, stoves, railings, etc., and to diminish the friction of the belts and other parts of machinery. Lately it has been suggested as a lubricating agent in the cartridges of rifles, instead of lard or tallow. Much B. L. is obtained at Borrowdale, Cumberland, Eng.; there are also great deposits in Missouri and in Siberia.

BLACK LETTER (**Black Letter**): name commonly

BLACK LIST.

given in the United States and England to the types which on the continent of Europe are generally known as Gothic. The first printed books imitated every peculiarity of the contemporary manuscripts; and as printing was first practiced in Germany and the Netherlands, the first types were copies of the letters in use in those countries in the middle of the 15th c. Two sorts of letters have been employed in the writings of Western Christendom. What have been called Roman letters prevailed from the 5th to about the close of the 12th c., when they gradually began to pass into what have been called Gothic letters, which continued till the 16th c., when, in most European countries, they were superseded by Roman letters. The first types, as has been said, were Gothic, and their use spread with the art of printing into various European states. In France and Italy, they were slightly modified by cutting off some of their rougher points; and when thus trimmed, they came to be known in the former country as *lettres de somme*, being so called, it is said, from their use in an edition of the *Summa* of St. Thomas Aquinas. The classic taste of Italy could not long tolerate the Gothic character even of the *lettres de somme*; and they were still further modified, until they assumed the shape to which the name of Roman letters has since been given. The first works printed with these new types were two beautiful editions of Pliny's *Natural History*: the one by John of Spires, Venice, 1469; the other by his disciple, Nicholas Jenson, Venice, 1472. Another Venetian printer—the first Aldus Manutius—attempted, 1501, to supersede the Roman letters by what have been called Aldine (q.v.), or Venetian, but are best known as Italic characters. These can scarcely be said to have come into more than temporary or exceptional use; but the Roman letters in no long time spread from Venice all over the w. of Europe. Although thus supplanted in general use, the Gothic or B. L. was long retained for special purposes, such as, in England, the printing of Bibles, prayer-books, proclamations, and acts of parliament. Books in B. L., being the earliest, are highly prized by antiquaries and bibliomaniacs, who are hence sometimes spoken of as ‘black-letter’ devotees. Thus, Matthias, in his *Pursuits of Literature* (1796), alluding to the commentators on Shakspeare, writes:

On Avon's banks I heard Actæon mourn,
By fell *black-letter* dogs in pieces torn;
Dogs that from Gothic kennels eager start, etc.

A form of the B. L. still continues in general use in Germany; but 40 per cent. of the books printed there in 1880 were in Roman letters, and the proportion is probably increasing—See PALEOGRAPHY.

BLACK LIST: name familiarly applied to printed lists relative to insolvency, bankruptcy, and other matters affecting the credit of firms and individuals, and which are circulated for the private guidance of the mercantile community. These lists, which serve an important purpose, and are printed and sent out (they can scarcely be said to be *published*)

weekly or bi-weekly, are well known by commercial men. In their contents are embraced in England, and to a large degree in the American lists (see **COMMERCIAL REGISTERS**), bankruptcies and liquidations by arrangement; registers of protested bills; decrees in absence; judgments for debt in the courts; offers of composition; dissolutions of partnership; warrants of attorney and cognovits; judges' orders; bills of sale, etc. The legality of issuing information of this kind has been challenged, but it has been determined that it is quite lawful. In fact, the lists are only extracts from public registers, as are the ordinary lists of bankruptcies in the newspapers. Private lists of a more searching kind are furnished to subscribers by special mercantile agencies in this country and in England. See **TRADE PROTECTION SOCIETIES**.

BLACK'LOCK, THOMAS, D.D.: 1721-91; b. Annan, Scot. The child of humble parents, and deprived of sight before he was six months old, he won for himself before he reached middle age the designation of an accomplished scholar, a cultivated thinker, and, for those times, a respectable poet. After going through the necessary course of academic study in Edinburgh, he was licensed as a preacher of the Established Church, 1759, and in 1762 was ordained minister of Kirkcudbright. The determined resistance of the congregation to the appointment, based apparently on his too philosophical and 'moderate' style of preaching (joined perhaps to the fact that he was the intimate friend of David Hume), led to a litigation, to his sensitive mind extremely distressing, and he resigned the charge in consideration of a small annuity. After this, he resided in Edinburgh till his death, occupied chiefly in teaching a limited number of boarding-pupils. A letter from him happily arrested Robert Burns on the eve of his departure for the West Indies, and thus, to all human appearance, saved from oblivion the greatest lyricist that the world has seen. A collected edition of B.'s poems was published, 1793, with a biographical sketch by Henry Mackenzie.

BLACK'MAIL: tribute formerly exacted by freebooting chiefs from the people in the border counties of England and Scotland, and along the Highland border. It is mentioned by Abp. Hamilton in his *Catechisme* (1552), and by Maitland in his *Thieves of Liddesdale* (abt. 1561), and it persisted until about the middle of the 18th c. Theft and robbery were not then regarded in the Highlands as they are now: to carry off the cattle of a neighbor was perhaps only wreaking out an old family quarrel or clan dispute, or making reprisals for some severity of persons in power. Certain it is that men of good standing gave a certain degree of protection to notorious cattle-lifters. In these circumstances, a class of men rose up who professed to take upon themselves the duty of protecting the property of individuals, on the payment by them of a percentage on their rents, generally 4 per cent. They were not low men who did so; nearly all of them had good Highland pedigrees, and passed externally as honorable persons, though there was only too great

BLACKMORE—BLACK MOUNTAINS.

reason to suspect that they encouraged and profited by robberies, in order to make the B. a necessity. The celebrated Rob Roy was, about 1730, a notable levier of B. in the southern Highlands and adjacent Lowland districts. A little later, Coll M'Donell of Barrisdale, a cadet of the Glengarry family, was equally noted further north. When one of the payers of the B. suffered what was called a *hershup*, the levier of the impost, being quickly informed of what had happened, busied himself to recover the lost cattle, and if he failed, he held himself bound to pay an equivalent. Mr. Lapslie, minister of Campsie, Stirlingshire, in his Statistical Account of the parish, 1795, relates that his father, John Lapslie, was a farmer who paid B. in 1744 to M'Gregor of Glengyle, the nephew of Rob Roy. The engagement was that he should make good losses, if the number of sheep stolen exceeded seven, for anything less was held as not a *hershup* or *lifting*, but merely a *picking*. Early in 1745, fifteen were stolen, and M'Gregor was honorably preparing to replace them, when the breaking out of the rebellion, in which he became involved, deprived him of the power of fulfilling his engagement, and put an end to his self-created wardenship of the Highland borders. After that period, law was vigorously enforced in the Highlands, and B. ceased—See under BLACK.

BLACKMORE, *blāk'mōr*, RICHARD DODDRIDGE : born 1825, Longworth, Berkshire, Eng. : novelist. He graduated at Oxford Univ. 1847; then studied law and practiced as a conveyancer. His first published work was *Poems by Melanter* (1854), the pseudonym being the Gr. word *melas* (black) in the comparative degree—'more black.' Other volumes of verses followed 1855, 60, 62, and 71. His first novel, *Clara Vaughan*, appeared 1864; his first distinct success as a novelist was won 1869 by *Lorna Doone : a Romance of Exmoor*. The plot of this story is good and well developed; the style, with the quaint and pleasing flavor of the time of James II., has a very remarkable poetic grace and charm, and the figures have much life and movement. Other novels by B. are: *The Maid of Sker*; *Alice Lorraine*; *Cripps the Carrier*; *Eréma*; *Mary Anerley*; *Christowell*; *Tommy Upmore*; *Springhaven*. D. 1900, Jan 21.

BLACK MOUNTAINS: a portion of the Appalachians in the w. part of North Carolina, mostly in Yancey co., extending within half a dozen miles of the Blue Ridge. It is named from the luxuriant growth of its evergreen vegetation. It is the most elevated region of the United States e. of the Mississippi, being the culminating portion of the Appalachian system; and it has more than a dozen peaks that are higher than Mt. Washington, N. H. The Black Dome, formerly called Mitchell's Peak, or Mt. Mitchell, is 6,732 ft. in height, and is generally conceded to be the highest of the group. Clingman's peak is 6,660 ft. high. The climate in the w. section of North Carolina corresponds in general to northern France and Belgium, but among these mountains it is colder.

BLACKPOOL—BLACK QUARTER.

BLACK'POOL: flourishing town in the township of Layton-cum-Warbreck, county of Lancaster, Eng.; now a very considerable place, on the coast of the Irish Sea, between the estuaries of the Ribble and the Lune, 4 m. from Poulton-le-Fylde, 18 m. from Preston. The numbers who resort here during the bathing-season far exceed the permanently resident inhabitants. Upwards of 100,000 visitors annually come from East Lancashire, Manchester, Yorkshire, and other parts of the kingdom. B. is one of the most frequented bathing-places in the west of England, the sands being excellent. It has a branch railway connecting it with the Preston and Wyre railway, which affords easy access from Preston, Liverpool, Manchester, and all parts of the kingdom. There is also another railway connecting it with Lytham, another favorite bathing-place on the Ribble, about 7 m. to the south. B. has a fine pier, furnishing sitting accommodation to upwards of 3,000 persons, which cost about £25,000; and a second, more recently opened, 500 yards in length. There are terraces of houses elegantly built, many large hotels, a promenade 3 m. long, with electric trains, a winter-garden, free library, several theatres, etc. The place was constituted a municipal borough 1876. A tower on the Eiffel model, 500 ft. high, is to be completed 1893. There is no trade or manufactures; the lodging-house keepers depend solely on the large concourse of visitors. Fishing is the enjoyment of many during the winter months. Pop. (1861) 3,506; (1871) 6,100; (1881) 14,448; (1891) 23,846.

BLACK PRINCE: name usually given in history to Edward, Prince of Wales, son of Edward III. (q.v.).

BLACK QUARTER, known also as **BLACK LEG**, **QUARTER EVIL**, and by various other names: disease of cattle appearing in somewhat various forms, but always malignant and contagious, and capable of being communicated to man by inoculation. It is due to the presence of a bacillus which can live in the soil for months and retain its vitality under any changes of climate. Cooking does not destroy the poison in the flesh of animals which have been affected by this disease, and many people have lost their lives by eating such meat. Mere contact with a sick animal, or with the carcass of one that has died, often serves to communicate the disease; it is also spread by mosquitoes and other insects. The disease appears most frequently in spring or autumn, and usually attacks animals which are young and thrifty. It appears suddenly, and sometimes is almost immediately fatal, though many cases linger for several days. The finding of one or more of his finest animals dead is frequently the first intimation which the farmer has that the disease has appeared among his herd. The symptoms vary, but there is usually a sudden lameness and always fever and pain. Tumors appear which are at first extremely tender, but which afterward become insensible, and from which bloody matter exudes. The lungs are congested, and decomposition commences before the animal dies. The

BLACK RIVER—BLACK ROD.

malignant nature of the disease and the quickness with which it runs its course at the commencement of an outbreak make remedial measures of but little value. Cases which appear after a part of the force of the malady has been spent are sometimes cured by treatment with tonics and antiseptics; but recovery is very slow, and the usual health is not always regained. On the appearance of this disease a competent veterinarian should be called at the earliest possible moment. Preventive measures consist in draining wet and malarious pastures; or, if this is impossible, removing the animals to higher lands as soon as the hot and dry weather comes; in protecting the animals from chills; in avoiding sudden changes from poor to rich pasture; and in supplying abundance of pure water. Pasteur's method of inoculation with weakened virus is sometimes successful, but must be carefully done or it will communicate the disease. Hypodermic injections of diseased blood which had been heated to 150° have given good results, and the addition of a small quantity of carbolic acid and chlorate of potassa to the drinking water of exposed animals has seemed beneficial. Stables in which diseased animals have been kept must be thoroughly disinfected, and the carcasses of those which have died should be covered with quicklime and deeply buried. Before and after contact with a sick animal, the hands should be washed in dilute carbolic acid.

BLACK RIVER, New York: a stream about 125 m. long, rising in Herkimer co., about 25 m. n.n.e. of Utica, flowing n.w. through Oneida and Lewis cos., to the Great Bend in Jefferson co., whence it flows w. and empties through Black River bay into Lake Ontario. It has a fall of 63 ft. at Lyons Falls, whence it is navigable to Carthage, a distance of 40 m. Black River canal, from Lyons Falls to Rome, affords communication with the Erie canal. Black river at Watertown, 6 m. from its mouth, is 175 ft. in breadth.

BLACK RIVER, or **BIG BLACK RIVER**: largest tributary of the White river, which it enters at Jacksonport, Ark., after a course of nearly 400 m.. It rises in the s.e. of Missouri, has a s.e. course in that state, a s.w. course in Arkansas. Small steamers ply on the lower 100 miles.

BLACK-ROD, n. *blāk'ród*, in Britain: an usher, high officer of the queen's household and of the house of lords; appointed by letters patent; so called from the black staff which he carries as a badge of office—he is also the usher of parliament. He is chief gentleman-usher to the sovereign, also usher of the order of the Garter. His principal duty is (himself, or by his deputy the yeoman-usher) to summon the house of commons to the peers when the royal assent is given to bills, or when royal speeches are read; and to take into custody any peer guilty of breach of privilege. His income is derived from certain fees under the regulation of the house; and the appointment of messengers, door-keepers, servants, etc., rests with him. This patronage was at one time very lucrative, but new arrangements have made it much less so.

BLACK ROOD OF SCOTLAND—BLACK SEA.

BLACK ROOD OF SCOTLAND: an ancient relic, formerly belonging to the Scottish kings. When the Anglo-Saxon Princess Margaret, who became the wife of King Malcolm Cearnmohr, landed in Scotland, about 1070, she brought with her what was regarded as a priceless relic—a cross of gold, elaborately wrought, in the form of a casket, about a span long, containing what was believed to be a piece of the true cross, set in an ebony figure of the Saviour, richly decorated with gold. Of its earlier history, nothing is known; but St. Margaret bequeathed it as an inheritance to her children, and as she was at the point of death (as her confessor relates) she had it brought to her bedside, when she pressed it to her eyes and lips, and expired clasping it with both her hands. The contemporary biographer of her son, King David I., relates that ‘the Black Rood of Scotland,’ as it was called, received the dying adoration of that saintly prince, and that it had then (in the middle of the 12th c.) come to be regarded by the whole nation of the Scots with mingled love and awe. It was kept as an heirloom of the kingdom, in the royal treasury in the castle of Edinburgh, and with the other regalia and muniments of Scotland, was delivered up to King Edward I., 1291. The irreverent scrutiny of the officers of the English king discovered that the outer case, which to the eyes of St. Aelrad, in the previous century, seemed purest gold, was only silver gilt. But the relic itself was not the less venerable on that account; and it was used by King Edward to give increased solemnity to the oaths of fealty which he exacted from the magnates of Scotland. Thus, when the bishops of St. Andrews and of Glasgow sided with Bruce, it was urged as a heinous aggravation of their guilt, that they had sworn ‘upon the body of Christ (i.e., the sacrament of the eucharist), and upon the holy gospels, and upon the cross of St. Neot, and upon the B. R. of S.,’ to be true and faithful to the English king and his heirs forever. When the long struggle between England and Scotland was at last ended by the peace of Northampton, 1328, the B. R. was restored to Scotland as one of the national treasures. But it was not destined to remain long in the north. When the hapless King David II. invaded England, 1346, he carried the B. R. with him, in the belief (common in that age), that such a holy relic would insure safety to his person or victory to his arms. On his defeat and capture under the walls of Durham, the B. R. of S. became the prize of his conqueror, Sir Ralph de Neville, Lord of Raby, by whom it was offered up, with other spoils of the battle, at the shrine of St. Cuthbert, in the cathedral of Durham. There it hung till the Reformation, when all trace of it disappears.

BLACK or EURINE SEA (*Pontus Euxinus*, or ‘hospitable sea,’ of the ancients, Kara Deniz of the Turks, Mauri Thalassa of the modern Greeks, and Tschernoje Moré of the Russians): an inland sea between Europe and Asia, extending from lat. 40° 45' to 46° 45' n., and from long. 27° 30' to 41° 50' e. In shape it bears a clumsy resemblance to the human foot. Its greatest length from e. to w., on the 42d

BLACK SEA.

parallel, is about 700 m., and its greatest breadth, near the w. end, about 380 m.; 172,000 sq. m. On the s.w. extremity it communicates by the Bosphorus, the Sea of Marmora, and the Dardanelles, with the Mediterranean, and on the n.e. by the Straits of Yenikale with the Sea of Azof. The B. S. drains nearly one-fourth of the surface of Europe, also about 100,000 sq. m. of Asia. Through its whole extent it has but one island, and that a small one, opposite the mouths of the Danube, called *Adassi*, or Isle of Serpents, on which is a light-house. The continued occupation of this island by the Russians, in defiance of the stipulations of the treaty signed at Paris after the termination of the Crimean war, occasioned considerable uneasiness in Turkey, and detained a British fleet in the B. S. for several months. In the centre of the B. S. there are no soundings at 150 fathoms, nor are there shoals along the shores, except at the entrance of the Bosphorus; the navigation of the B. S. ought, therefore, to be particularly easy and safe. It is so in summer; but in winter, being inclosed on every side, it becomes the scene of conflicting winds, and of storms which, though of short duration, are terrible while they last. In such a storm, 1854, Nov. 14, about forty vessels of the allies were either totally wrecked or seriously injured, nearly 1,000 lives were lost, and property worth millions destroyed.

All the coasts are high, with good harbors, except between the mouths of the Danube and the Crimea; there the land is low, and the danger of navigation greatly increased in winter by the presence of floating ice; for, from the many large rivers which flow into the B. S. and Sea of Azof (Danube, Dniester, Bug, Dnieper, Don, and Kuban, in Europe; and the Kizil-Irmak and Sakara in Asia), the waters are fresher, and consequently more easily frozen than those of the Mediterranean. The specific gravity of the water of the B. S. is 1,014 (water being = 1,000), while that of the Mediterranean is 1,028. The shores from Odessa to the Crimea are ice-bound during Jan. and Feb.; and though the harbor of Odessa is never frozen up, yet the drift-ice frequently renders the entrance to it dangerous.

There is no tide in the B. S.; but the large rivers flowing into it give rise to currents, which are particularly strong in spring when the snows melt, and the accumulated moisture of the whole winter is drained off the land. The great current which, passing out of the Sea of Azof round the Crimea, flows first s.w., then n.w., and again due w., is turned s. by a current from the Dnieper and Dniester; the two currents are afterwards met by another from the Danube, and then, all united, rush towards the Bosphorus. The Bosphorus, however, is not wide enough to admit the entire volume of water pressing into it; and a portion of the main current is consequently diverted to the coast of Asia, where it is strengthened by new accessions. This, which is the normal course of the currents in the B. S., is modified by the winds, and by local circumstances. In some bays of Roumelia and Bulgaria counter-currents have been observed.

BLACK SILVER—BLACK SNAKE.

The most important ports on the B. S. are those of Odessa, Kherson, Eupatoria, Sebastopol, Batum, Trebizond, Samsun, Sinope, Varna, etc.

The depth of the water is unfavorable to the extensive establishment of fisheries, but several kinds of sturgeon are caught in considerable quantities in the Straits of Yenikale. Other fish of various kinds are said to be abundant.

The ancients believed that the B. S. was at one time much more extensive, and that it had no connection with the Mediterranean. They accounted for its decrease and communication with the larger sea by the supposition that the Thracian Bosphorus had been burst through by an earthquake, or by the great deluge known as the Deucalion deluge, which inundated Greece. The B. S. being higher than the Mediterranean, the latter, of course, through the newly created channel, became the basin for much of its waters. Certain geological and other appearances have led some modern geographers to entertain an opinion similar to that of the old Greeks, which, however, is not shared in by others.

The B. S. has been navigated from a very early period. Its original name (supposed to have arisen from the dangers such an expanse of sea offered to early navigation, as well as from the fact that savage tribes dwelt upon its coasts) was *Axine*, or 'inhospitable' sea, afterwards changed by the Greeks to *Euxinus*. In the time of Xerxes, large quantities of corn were exported from its ports to Athens and the Peloponnesus. The Romans and Byzantine emperors, and also the Genoese, had large traffic on the Black Sea. When the Turks captured Constantinople, all but their own ships were excluded from its waters until the treaty of Kinarji, 1774, when the Russians obtained the right to trade in it. Ten years later, Austrian ships were privileged to trade here; and by the Peace of Amiens, 1802, British and French ships were admitted. The undue preponderance of Russia in the B. S. was the main cause of the Crimean war.

BLACK SILVER, or **STEPHANITE**, *stěf'an-īt*: a mineral consisting of silver 68·5, sulphur 16·2, antimony 15·3; found with other silver ores in many different parts of the world; notably in Mexico, Saxony, the Hartz Mountains, Idaho, and in the Comstock lode in Nevada. It is sometimes called *brittle silver ore*.

BLACKSMITH, n. *blāk'smith* [see **BLACK**]: one who manufactures articles from iron.

BLACK SNAKE (*Bascanion constrictor*, family *Colubridæ*): species of snake common in the e. United States and south. It is shining black above, greenish below, with white throat and chin; length 4–5 feet. The young are olive, with black rhomboid blotches. It is remarkable for its great agility. It moves along the ground with a swiftness equal to that of a horse, glides over bushes, and climbs trees. It feeds on small quadrupeds, birds, frogs, etc.; frequently plunders poultry-yards.

BLACKSTONE.

of eggs; and enters dairies to drink milk or cream. It has no poison-fangs, and is not injurious, though it is not slow to bite. It is easily tamed.—There is a quite different and very venomous B. S. common in Australia. See AUSTRALIA.

BLACKSTONE, *bl'k'stōn*: town in Mass., on the Blackstone river, at the state line in Worcester co., a portion of the town lying in Providence co., R. I. Situated at the intersection of the Providence and Worcester with the New York and New England railroad, 18 m. n.w. of Providence and 36 m. s.w. of Boston, it has good trading advantages. It has half a dozen churches, an important manufactory of cotton prints, and manufactures of woolen goods, shoddy, and scythes. Pop. (1890) 6,138; (1900) 5,721.

BLACKSTONE, Sir WILLIAM: 1723, July 10—1780, Feb. 14; b. London; posthumous son of a silk-mercator: he was a commentator on English law. At the age of 15, having obtained a scholarship from the Charterhouse School, where he was educated, he was sent to Pembroke Hall, Oxford. There he obtained a second scholarship, and remained till, in 1744, he was admitted a fellow of All Soul's College, when he removed to London, to attend the courts of law with the view of qualifying himself for his future profession. In 1746, at the age of 23, he was called to the bar, but failed to attract either notice or practice. Upon the death of an uncle, 1749, he was appointed recorder of Wallingford, Berkshire; but in 1753 he went to Oxford, where he delivered a course of academic lectures upon the law of England. A few years later, a Mr. Viner having left a sum of money to endow a chair of English law in the Univ. of Oxford, B. was, in 1758, appointed first Vinerian professor. The following year B. returned to Westminster; and as the doctrines which he had taught as a lecturer had been such as to commend him to the notice of the tory government of that day, he obtained its patronage, and in 1761 was made a king's counsel. Shortly afterwards he was appointed principal of New Inn Hall, Oxford. Other honors followed fast, and he became successively member of parliament, bencher of the Middle Temple, and solicitor-gen. to the queen. In 1765, B. published the first vol. of his lectures, and the remaining three vols. 1765–69. These lectures form his celebrated *Commentaries on the Laws of England*. His practice continuing to increase, he resigned, 1766, his Oxford appointments. Four years later, he was offered the solicitor-generalship, and, after declining it, was knighted, and made a justice of the court of common pleas. The remaining years of his life were spent in the discharge of his duties as a judge.

The fame of B. rests entirely upon his *Commentaries*. His other literary works were inconsiderable, and his merits as a pleader or judge were not such as, of themselves, to have made his reputation outlive himself. As a commentator, he had many excellences. His style was in general clear and gracefully ornate, and his illustrations

BLACK STONE EXAMINATIONS—BLACK WATCH.

pleasing and felicitous. While he confined himself to exposition—to the accurate statement in scholarlike English of what had heretofore lain buried in the cumbrous language of lawyers like Littleton—B. was unsurpassed, and rendered an important service to the country. But he was ambitious of combining with this exposition the higher task of explaining the reasons for the law, as well as its merits and defects. For this survey of the law, from the legislator's point of view, he had not the requisite qualifications. His knowledge of English history was, as Hallam remarks, superficial, and his study of the philosophy of law had been imperfect. With the works, indeed, of Montesquieu and Beccaria he was acquainted; but the mode in which he quotes them shows that he had imbibed nothing of their spirit. The method followed in the *Commentaries* was utterly unscientific and had not even the merit of originality. It was taken, with little alteration and no improvement, from Sir Matthew Hale's *Analysis of the English Law*. Possibly the haste with which the *Commentaries* must have been composed, being originally in the form of lectures, may have led to some of their imperfections. Since B.'s death, the *Commentaries* have been very frequently reprinted, perhaps the best editions being those of Christian. As a century has elapsed since they were composed, so many alterations are requisite to adapt them to the existing state of the law that it may be said that their purpose has been served, and that they are now valuable chiefly as materials for history.

BLACK STONE EXAMINATIONS: see GLASGOW UNIVERSITY.

BLACK WAD: name given by miners to the native black oxide of manganese, and principally to an impure and earthy variety of the ore. See MANGANESE.

BLACK WALL: suburb of London, in Middlesex, at the junction of the Lee with the Thames, four m. e.s.e. of the metropolis. It has foundries, ship-building yards, and the East and West India docks. A railway, four m. long, mostly on a brick viaduct above the streets, connects B. with the city of London. To avoid the dangers and delay of the 'Pool,' many passengers proceed by this railway to embark in steamers at B., instead of going on board at London Bridge.

BLACK WAR'RIOR: river formed, in the n. of Ala., by the junction of the Mulberry and the Locust. Almost from the very point of confluence it is navigable for steamboats, till, after a course of more than 150 m., it enters the Tombigbee, which again is navigable for large vessels all the way to Mobile on the Gulf of Mexico, nearly 200 m. more. Along its course are found coal, iron, and other valuable minerals.

BLACK WATCH: appellation given to certain armed companies dressed in dark-colored tartans, employed to keep order in the Highlands of Scotland. Some Highlanders had been armed by government as early as 1725; but about 1729-30 the companies assumed a regular form, being

BLACK-WATER—BLACKWELL.

six in number—three of 100 men each, and three of 70 men each. The six were stationed in different parts of the Highlands, acting independently of each other. The body was raised chiefly from the whig or loyal clans—Campbells, Grants, Munros, etc.—and many men of good station in society joined it, not only for the sake of good pay, but the valued privilege of bearing arms. The duties of the B. W. were to enforce the disarming act, to overawe the disaffected, to prevent political meetings of a seditious kind, and to check depredations among the clans, or on the Lowland frontier. The whole of the companies were formed into the 42d Regt. under the command of the Earl of Crawford, 1739. Retaining its original Highland character, the 42d Regt. became one of the most-distinguished corps in the British army. As it was embodied under the Earl of Crawford, a Lowlander, it was necessary to adopt an arbitrary pattern of tartan, which has ever since been known as the 42d or B. W. tartan. When in 1881 the numerical designations of the British foot-regiments were dropped, the former 42d and 73d regiments were made respectively first and second battalions of the 'B. W. (Royal Highlanders).' See HIGHLAND REGIMENTS: TARTAN.

BLACK-WATER: a disease in cattle: see RED WATER.

BLACKWATER: river of Cork county, Ireland; rising in the w. of Kerry county; runs e. across Cork county and the w. part of Waterford county, in a carboniferous limestone basin, past Mill-street, Mallow, Fermoy, Lismore, and Cappoquin, and enters the sea at Youghal harbor. Mountains bound it on the s., and its chief feeders come from the n. It has a course of 100 m., and is the seventh in size of the Irish rivers. The scenery along its banks is highly beautiful and picturesque, with ruins, mansions, and woods. It is navigable for barges for the lower 15 m. of its course. It abounds in salmon.

BLACKWATER: river prov. of Ulster, Ireland; rising on the confines of Tyrone and Fermanagh counties; runs first s.e., then n.w. through Tyrone; then between Tyrone, Monaghan, and Armagh, past Caledon and Charlemont, and falls into the s.w. corner of Lough Neagh.

There are in all five Irish rivers of this name.

BLACKWELL, ALEXANDER: b. Aberdeen, Scot., early in 18th c.; d. Sweden, 1748, Aug. 9: physician. He was son of the Rev. Thomas B., one of the ministers of Aberdeen and principal of Marischal College. He studied physic under Boerhaave at Leyden, where he took the degree of M.D. He was afterwards a printer in London, but becoming bankrupt, 1734, was supported in prison by his wife, who prepared and published a *Herbal* (2 vols. folio, 1737–39) with 500 cuts of plants, drawn, engraved, and colored by herself, her husband adding their Latin names, with a brief description of each. The work, patronized by the College of Physicians, had great success, and B. obtained his release. A work on Agriculture, published by him, falling under the notice of the king of Sweden, B. was invited to Stockholm. 1740, and received

BLACKWELL—BLACKWOOD.

apartments in the house of the prime minister, with a pension. Having cured the king of a dangerous illness, he was appointed one of the royal physicians; but while high in court favor, he was charged with conspiracy with Count Tessin against the king and govt., and after torture he was broken on the wheel, protesting his innocence.

BLACK'WELL, ELIZABETH, M.D.: 1821—; b. Bristol, England. Her father emigrated 1832, and for several years resided in New York, but settled 1838 in Cincinnati, where he died. Elizabeth studied medicine in Asheville, N. C., and Charleston, S. C., supporting herself by teaching. She made many unsuccessful attempts to enter medical schools, but was at last admitted to one at Geneva, N. Y., where she graduated with the degree M. D., 1849, Jan. She then went to Paris, and London, where she studied obstetrics. In 1851 she began practice in New York, and, with her sister Emily B., organized an infirmary for women and children in that city. She went to England 1859, and delivered lectures on the subject of medical education for women, but returned 1861, and busied herself in organizing medical relief for the sick and wounded in the army. In 1868 she became professor in a woman's medical college that she had assisted in organizing in London. She published *Laws of Life*, etc.

BLACKWELL'S ISLAND: in the East river, from opposite 50th to 84th sts., New York; $1\frac{3}{4}$ m. long, $\frac{1}{8}$ m. wide, comprising 120 acres. It was owned by the Blackwell family for a century or more, whence its name. It is occupied by public penal and charitable institutions. A new East-river bridge to connect the boroughs of Manhattan and Queens, begun 1901, July, has central piers on the island.

BLACKWELL, LUCY (STONE): 1818, Aug. 13—1893, Oct. 18; b. West Brookfield, Mass.: reform advocate. She graduated at Oberlin College in 1847, and immediately began her career as a lecturer in behalf of anti-slavery and woman suffrage. In 1855, she married Henry B. Blackwell, but by previous agreement retained her maiden name. She was editor of the *Woman's Journal*, of Boston. She lectured in all parts of the United States, continuing her labors until her death.

BLACKWOOD, WILLIAM: 1776, Nov. 20—1834, Sep. 16; b. Edinburgh: publisher. After serving his apprenticeship to the bookselling business in his native city, and prosecuting his calling in Glasgow and London, he settled in Edinburgh as a bookseller—principally of old books—in 1804. In 1817, having become a publisher on his own account, he issued the first number of *Blackwood's Magazine*. The literary ability displayed in this periodical, much in advance of the monthly magazines then existing, gave it success from the start. Its remarkable popularity was sustained by the papers of John Wilson (q.v.) and J. G. Lockhart (q.v.), also of James Hogg (q.v.), and other writers, whom B. had the liberality and tact to attract to his standard. Overwhelming its political and literary opponents, now with the most farcical humor, and now with the bitterest sarcasm—sometimes with reckless injustice—

BLADDER.

the Magazine secured for itself a prodigious reputation, particularly among the tories, of whose political creed it has always been a resolute adherent. Probably it cannot be said that *Blackwood's Magazine* has ever had any distinct editor. William B. himself, who added literary tastes and acquirements to his profession of a bookseller, was the chief manager of his Magazine, and conducted all the correspondence connected with it until his death. Under his sons, who succeeded him in the business, *Maga* not only sustained but increased its reputation; and under his grandson the places of its old contributors are still supplied by many of the most distinguished men of letters in the country. In the conduct of the Magazine, Professor Aytoun was understood to occupy, in relation to the publishers, a position somewhat analogous to that which Wilson had formerly held. The publishing business, which includes that of printing the works issued, has been greatly extended since the days of the founder of the house.

BLADDER, n. *blăd'dër* [AS. *blædre*; Icel. *bladra*, a bubble, a blister: Ger. *blatter*, a pustule]: a thin sack or bag in animals, capable of distension, for containing particular fluids, such as the *urine* and the *gal*. **BLADDERED**, a. *-dërd*, swelled like a bladder. **BLADDERY**, a. *-dër'î*, like a bladder. **BLADDER-SENNA**, the English name of *Colutea*, a genus belonging to the papilionaceous sub-order of the *Leguminosæ*. **BLADDER-WORTS**, aquatic plants so named from the utricles or bladders connected with the leaves; the genus of plants *Utriculăriă*, ord. *Lentib-ulăriă'cææ*.

BLADDER (urinary): a bag formed of fibrous membrane externally, muscular fibres in the middle, and mucous membrane for an internal lining. The peritoneum (see **ABDOMEN**) covers its back. The shape of the B. is somewhat conical, the *apex* being upwards, and the anterior part of the *base* constricted at the commencement of the urethra, called the *neck* of the bladder. On each side, rather below its middle, open the two ducts from the kidneys (the ureters); an imaginary line drawn between them, and from each end of this line others drawn to the neck of the bladder include an equilateral triangle. In this space, which is called the *trigone*, the mucous membrane is not thrown into folds, but is smooth and very sensitive, the slightest touch upon it giving rise to a desire for micturition. The habit of some children to empty their bladders when sleeping on their backs is supposed to be due to the urine accumulating in this part, as is also the distressing pain of stone.

The B. is situated in the pelvis in adults, but much higher in the young. It is kept in position by four true or membranous ligaments, and false ligaments formed of folds of the peritoneum. The neck of the B. is surrounded by the prostate gland, and here the urethra (q.v.) begins. Like all cavities lined by mucous membrane, the B. is subject to catarrhal inflammations, which are accompanied by an increased secretion of mucus, rendering the urine turbid, frequent and painful desire to micturate, and very great con-

BLADDER CAMPION—BLADDER NUT.

stitutional disturbance. If the symptoms be acute, they may be relieved by local bleeding, and hot fomentations together with opiates; but by far the most important measure is to search for the exciting cause, and remove it if possible. Among the most frequent causes, are stricture of the urethra due to gonorrhea, with extension of the inflammation into the bladder, hypertrophy of the Prostate (q.v.), and calculus. The acute forms frequently pass into the chronic, and are then most intractable and obstinate of cure. If due to the extension of gonorrhea and stricture, no treatment of the bladder itself is of the slightest value unless the stricture is removed, either by dilatation or cutting, and the gonorrhea cured. If due to enlargement of the prostate, and this is a common cause in men past middle life, it is impossible for such a patient ever to empty his bladder completely. The urine that remains behind, known as residual urine, decomposes, and excites an inflammation of the bladder walls, which secrete an amount of mucous. The urine is turbid, generally highly alkaline, offensive in odor, and very irritating to the inflamed bladder, and the patient is compelled to empty his bladder very frequently, in some cases as often as 60 times in 24 hours. In consequence the patient becomes emaciated and enfeebled from loss of sleep and from pain. This condition may be met in one of two ways: Either (1) the urine must be drawn off regularly with a catheter specially constructed to pass behind the hypertrophied prostate, and the bladder irrigated with a bland, unirritating, antiseptic wash, such as a solution of boric acid in warm water—the patient being compelled for the remainder of his life to use a catheter; or (2) the patient must submit to the operation of prostatectomy or removal of that portion of the prostate that obstructs the flow of urine. If the inflammation of the B. be due to stone, removal of the stone is imperative (see LITHOTOMY: LITHOTOMY).

Irritable B. resembles the former disease, but is produced by various causes unaccompanied by inflammation. Some persons, from mere nervousness, are frequently troubled with a desire to pass water; and, strange as it may seem, many in this condition never effectually empty their bladders, always leaving a portion, which keeps up the irritation. This condition frequently arises from the habit of retaining the urine so long as to over-distend and weaken the muscular walls of the B.; but it may be induced by general debility, the irritation of worms, cold, or an irritating state of the urine itself. The best treatment is tonics, and soothing the irritability with sedatives. When this irritability is nocturnal, it may be from the patient lying on the back, as explained above; it generally occurs in delicate children, and is more a habit than a disease.—See in general, URINE, INCONTINENCE OF: RETENTION OF URINE

Paralysis of the B. may be the result of accident, or disease of the nervous centres, or over-distension; in this condition the urine accumulates and dribbles away, and must be drawn off by the catheter (q.v.). This dribbling, or *incontinence*, must be carefully distinguished from

BLADDER CAMPION—BLADDERWORT.

irritable B., as it is in nearly every case the sign of a distended bladder. *Retention* of the urine may be caused by mechanical obstacles to its exit, by paralysis or by an absence of volitional power over the muscles. This last is termed *Hysterical* retention, and is common in young girls, in persons suffering from sea-sickness, from being in a strange place, an accident, such as a broken leg, etc. If the affection is not encouraged by an officious use of the catheter, the power generally soon returns. Any long continued difficulty in passing water is generally followed by a thickening of the walls of the B. itself, or *Hypertrophy*. The mucous membrane may form pouches in these thickened walls, which is called *Sacculated B.*, and cancerous diseases, and tubercle, may also attack this organ.

The B. is liable to be ruptured by accident from without, as, for instance, by a blow or hurt from a saddle; and as this accident is usually fatal, it cannot be too carefully guarded against. If the B. is ruptured posteriorly, the accident is always fatal.

BLADDER CAMPION: see **SILENE**.

BLADDER GREEN see **BUCKTHORN**.

BLADDER NUT (*Staphylea*): genus of plants which, according to some botanists, is the type of a small nat. ord. *Staphyleaceæ*; by others, united with *Celastraceæ*; by Gray, with *Sapindaceæ*. These plants have usually opposite pinnate leaves, the leaflets of which, as well as the leaves themselves, have deciduous stipules. The sepals, petals, and stamens are equal (five) in number. Only about fourteen species are known, found in very different climates and scattered over the world. They are mostly small trees of rather elegant appearance. The seeds contain a considerable quantity of a fixed oil, which is slightly purgative. The common B. (*Staphylea pinnata*) is a native of the e. of Europe, and of temperate parts of Asia, which has been admitted into the British flora, but has in all probability been introduced as an ornamental tree. It is frequently planted in shrubberies, as is also *S. trifolia*, a N. American species with ternate leaves. The wood of both is firm and white, well suited for the purposes of the turner. The seeds may be eaten, but act as a mild aperient. The flower buds are pickled as capers. The name B. has reference to the curious, inflated membranous capsule, and the hard bony testa of the seed. The name *Staphylea* is from the Greek *staphylê*, a bunch of grapes, and has reference to the racemed flowers.

BLADDERWORT (*Utricularia*). genus of plants of the nat. ord. *Lentibulariaceæ* (q.v.), containing a large number of species, the bright blossoms of which, with those of water lilies, etc., adorn the surface of lakes, ditches, and marshes in almost all parts of the world. They are particularly abundant within the tropics, and many are natives of Australia. These plants are very interesting from the provision made for the expansion of their flowers above

BLADE—BLAEU.

water, although the whole plant is ordinarily submerged. The roots, stems, and even leaves, are furnished with numerous little bladders or vesicles, which are filled with water till it is necessary that the plant should rise for the expansion of the flowers, when they become filled with air; and this again gives place to water after flowering is over, so that the seeds are ripened at the bottom. The bladders, at least of *U. vulgaris*, have an orifice closed by a very thin elastic valve opening inwards. Aquatic insects sometimes enter them, and are imprisoned. N. Amer., many species.

BLADE, n. *blād* [Icel. *blad*, leaf of a tree, blade of a sword: Ger. *blatt*; Dut. *blad*, a leaf, a plate: Gael. *blath*, a bloom, a flower]: the long leaf or lamina of grass, or of a like plant; the cutting part of an instrument or weapon, as of a knife or sword; the broad part of an oar; the part of a tool that is broad or thin; a brisk, gay, bold fellow: V. to furnish with a blade. **BLADING**, imp. **BLADED**, pp.: **ADJ.** applied to crystals composed of long and narrow plates, like the blade of a knife; laminated. **BLADE-BONE**, the flat bone of the shoulder. **BLADES**, n. plu. *blādz*, the principal rafters or breaks of a roof.

BLADENSBURG, *blā'denz-burg*: post-town of Maryland, on the e. branch of the Potomac, and on the Washington and Baltimore railway. It is six m. n.e. of Washington; and here was fought the battle whose result was the capture of that city by the British, 1814, Aug. 24. In olden times B. was a famous dwelling-ground. Pop. (1890) 503; (1900) 463.

BLAEBERRY, n. *blā'bēr-rĭ*, the name in *Scot.* for the **BILBERRY** (q.v.): see also **WHORTLEBERRY**.

BLAES, *blāz*: Scottish colliers' name for the shale of the coal-measures, originating apparently from the 'blae' or bluish color sometimes noticed in the shale. The term is occasionally used by geologists.

BLAEU, *blā'eh*, **BLAEUW** or **BLAUW**, *blow* (Lat. *Cæsius*): name of a family of learned Dutch publishers who have rendered as important services to literature and art as Aldus, Giunti, Stephanus, or Elzevir, and whose activity spread itself over Europe for a century.

BLAEU, WILLEM: 1571–1638, Oct. 21; b. Alkmaar, Holland: mathematician, map-drawer, and publisher. He belonged to the school of Tycho Brahé, and published a terrestrial and a celestial globe, and several maps, excelling all that preceded. As a printer his work was good, though not rivalling Elzevir.

BLAEU, JOHAN. b. Amsterdam, about the beginning of the 17th c.; d. abt. 1680, son of Willem B. He was in the publishing business with his father. His *Atlas Major*, 11 vols., is a splendid work, full of archæological and geographical information, with many curious plates and valuable maps. He published also a series of singularly rich topographical plates and views of towns. He left three sons, Johan, Willem, and Peter, of whom the first and third carried on the paternal business. Their Cicero's *Orationes* (1699) are still prized.

BLAIKIE—BLAINE.

BLAIKIE, 'blā'kī, WILLIAM GARDEN, D.D., LL.D.: Scottish Presb. clergyman and author: 1820, Feb. 5—
—; b. Aberdeen. Having graduated at Aberdeen Univ., he studied theol., was ordained to the ministry of the Church of Scotland, and was made pastor of the parish of Drumblade. At the disruption of that chh. 1843, B. was one of the 474 ministers who, headed by Dr. Thomas Chalmers (q.v.), organized the Free Church of Scotland (q.v.: see also DISRUPTION). He became prof. of apologetics and pastoral theol. in New Coll., Edinburgh, 1868. He was one of the main promoters of what is now called the 'Pan-Presb. Alliance,' known first as the 'Alliance of Reformed Churches Holding the Presb. System.' He has pub., *Better Days for Workingmen; Personal Life of David Livingstone; The Work of the Ministry.*

BLAIN, n. blān [AS. *blegen*; Dut. *blein*; Dan. *blegne*; Icel. *blina*; prov. Sw. *blena*, a boil or pimple]: a sore; a blister; among *cattle*, a malignant carbuncle in the mouth, and especially on the tongue.

BLAINE, blān, JAMES GILLESPIE: statesman: b. W. Brownsville, Pa., 1830, Jan. 21—d. 1893, Jan. 27. He received preparatory education at home and at school in Lancaster, O., and graduated at Washington and Jefferson College, in his native co., 1847. As a student he had a marked taste for historical study, and excelled his fellow-students in literature and mathematics. In 1850 he removed to Ky., and was appointed teacher of mathematics in Western Military Institute, Blue Lick Springs. Two years later he resigned to accept an appointment as instructor in the Pennsylvania Institution for the Blind, Philadelphia, and during the few months he held this office he began studying law and contributing articles to the *Philadelphia Inquirer*. In 1853 he removed to Augusta, Me., became editor of the *Kennebec Journal* in that city, and subsequently purchased a half interest in the paper. He contributed largely to the formation of the republican party, and was a delegate to its first national convention 1856. By this time he had achieved wide repute as a political writer and platform speaker. The facility with which he massed facts, figures, and historical illustrations, the fluency of his speech, and magnetism of his personal presence, combined to make him at that early age a leader among men. In 1858 he was elected a member of the Me. legislature, and served by continuous annual re-elections till 1863, and was speaker during the two last terms. In 1862, Sep., he was elected member of congress from the third Me. district as a republican, and was re-elected for six successive terms, thus serving continuously 14 years. After the election of Speaker Collfax as vice-pres. 1868, B. was chosen to succeed him in the house, and was its speaker from 1869 till 1875, when the democratic majority elected Michael C. Kerr speaker. In 1876, July, B. was appointed by the gov. of Me. a member of the U. S. senate to fill the vacancy caused by the appointment of Senator Lot Morrill as sec. of the U. S. treasury; and at the ensuing session of the legislature was elected for the full senatorial term, expiring 1883, Mar. 4. A month after the

BLAINE.

election of Gen. James A. Garfield to the presidency, he urged B. with all the warmth of long personal and political friendship to enter his cabinet as sec. of state. The acceptance of this office caused B.'s resignation as U. S. senator, and closed an uninterrupted service in congress of 18 years. During this period he was an indefatigable worker, both in the committee room and on the floor of the house and senate. In the 38th congress he was a member of the house committee on post-offices and post-roads; 39th, on milit. affairs, war debts of the loyal states (chairman), and the special committee on the death of Pres. Lincoln; 40th, on appropriations and on rules; 41st, 42d, and 43d, as speaker, on select committee on rules; 44th, senate committees on appropriations and on naval affairs; 45th, on rules (chairman), naval affairs, and select committee on the levees of the Mississippi river; and 46th, on appropriations, naval affairs, and rules. During his congressional career he was conspicuously instrumental in securing the introduction of the present postal car system; earnestly supported all measures for the uncompromising prosecution of the war; took a foremost part in legislation for the reconstruction of the states previously in rebellion; forced the embodiment, in the XIVth amendment to the federal constitution, of his theory that representatives and direct taxes should be apportioned among the states according to their respective numbers, to be ascertained by a special census; drew up and championed till adopted the 'Blaine amendment' to the reconstruction bill, reported by Thaddeus Stevens 1867, Feb. 6, providing that any of the so-called Confederate states should be entitled to representation and be freed from the provisions for milit. govt. when they respectively should assent to the XIVth constitutional amendment and establish impartial suffrage, and have their action approved by congress; and led in discussion on the English doctrine of perpetual allegiance, till the treaty of 1870 gained from Great Britain the acceptance of the American principle of equal protection for adopted and native citizens. His career in the house, as much from his own temperament as from current circumstances, was an extremely excited one. In its closing months, actions of personal antagonism were taken that caused him much mental suffering. He was accused of having received \$64,000 from the Union Pacific railroad company for services rendered; and when he produced evidences to prove the falsity of the charge, other accusations were alleged, which he similarly met. 1876, May 2, a resolution was adopted by the house providing for the investigation of an alleged purchase of certain railroad bonds by the Union Pacific company. B. and his friends believed that he was the real object of the proposed investigation, and within a few days he learned that his letters in a long business correspondence with Warren Fisher, Jr, of Boston, had been collected and indexed by James Mulligan, and were to be used against him in the investigation. He succeeded in gaining control of the let-

ters, and June 5 from his desk in the house exhibited the letters and invited the confidence of his countrymen while he read them, thus producing a most dramatic scene.

The beginning of his senatorial career was nearly simultaneous with the opening of the republican national convention. His admirers presented his name for the nomination for pres. of the United States, and clung to him with such tenacity that on the 7th ballot he received 351 votes, lacking only 28 of a majority, the nomination going to Gov. Rutherford B. Hayes (q.v.), of O. After taking his seat in the senate, he opposed the Electoral Commission Bill, claiming that congress did not possess the power that it proposed to confer; opposed the Bland Silver Bill; favored a bi-metallic currency; and urged the development and protection of American shipping. In the republican national convention 1880, when Gen. Grant's name was presented for a 3d term, B. received 284 votes to 304 for Grant on the 1st ballot, Gen. James A. Garfield (q.v.) ultimately receiving the nomination. His tenure of the office of sec. of state was limited to less than a year by the assassination of the pres., and he was succeeded by Frederick T. Frelinghuysen, who served to the close of Pres. Arthur's administration. While sec. of state, and with the approval of Pres. Garfield, he issued invitations to a Pan-American conference to be held in Washington; but these invitations were recalled by Sec. Frelinghuysen by authority of Pres. Arthur. After the death of Pres. Garfield, B. was honored with a joint invitation by congress to deliver a memorial address, which he did in the hall of the representatives 1882, Feb. 27. In Dec. following the resignation of his office was accepted. In the leisure of his retirement from public life, he applied himself to the compilation of a historical work, *Twenty Years of Congress*, issuing the 1st vol. 1884 and the 2d 1886. At the republican national convention 1884, he received 334½ votes on the 1st ballot, and on the 4th gained the presidential nomination by a vote of 541 out of a total of 813. A bitter canvass followed, in which the Mulligan letters played a large part; and there was a strong defection of prominent members of the republican party from its candidate to Grover Cleveland (q.v.), the democratic nominee. There was a loss also of many thousand republican voters who supported the prohibition candidate for president. However, the probability of B.'s success was strong till an unfortunate expression by one of the speakers at a reception tendered B. in New York a few days before the election, turned from his support a multitude of Rom. Cath. Irish who had been counted as favoring him. By a margin so narrow that a few hundred votes decided the result, Cleveland, who had been chosen gov. of N. Y. by a majority of over 192,000, received the electoral vote of that state, and became president. Subsequently B. was active in the Me. state elections, and 1887 started on a lengthy European trip. During his absence his friends continued to consider him as an available

BLAINVILLE—BLAIR.

candidate for the presidential nomination 1888, till Feb. of that year, when the chairman of the republican national committee published a letter from B. in which he declared himself no longer a candidate for the nomination. On the election of Benjamin Harrison (q.v.) 1889. B. was again tendered and accepted the office of sec. of state. One of his earliest acts was to reissue his invitations to the Mexican and the S. and Central American govts. for a joint conference in Washington. The delegates began their business session 1889, Oct. 2, electing B. presiding officer. They adjourned *sine die* 1890, Apr. 19. During the last two years of his life, B. suffered—always with great fortitude—from chronic ailments. His last important official act was procuring the insertion in the McKinley tariff bill of clauses arranging for reciprocal commercial relations with foreign countries under specific stipulations. He resigned from the cabinet 1892, June 4, and at the national republican convention at Minneapolis, June 7–11, was named as a presidential candidate, though in the autumn of 1891 he had in a published letter distinctly withdrawn his name from the candidacy; but the nomination went to Mr. Harrison.—B. died at Washington. Few public men in any land have drawn forth warmer personal esteem and love, or fiercer and more persistent political attack. His manners had a rare charm; his oratory was impressive and magnetic like his personality.—His *Twenty Years in Congress* is an elaborate and brilliant historical work.

BLAINVILLE, *blăng-vêl'*, HENRI MARIE DUCROTAY DE: 1778, Sep. 12—1850, May 1; b. Arques, near Dieppe: distinguished French zoologist and anatomist. He studied medicine and the physical sciences in Paris, taking his degree 1808. In 1812 he was appointed assist. prof. of compar. zoology, anat., and physiol. in the Univ. of Paris; and 1832, successor of Cuvier in the chair of compar. anat. in the Museum of Nat. Hist. Besides small treatises, he pub. many large and valuable works; such as *Cours de Physiologie, Générale et Comparée* (1833); *Ostéographie* (1839–49), *Manuel de Malacologie et de Conchyliologie* (1825–27); *Manuel d'Actinologie et de Zoophytologie* (1834–37).

BLAIR, or PORT BLAIR: principal British settlement of convicts on the Andaman Islands in the Bay of Bengal, named after Lieutenant Blair, R.N., who selected the place in 1789. It is off the s.e. coast of South Andaman Island, lat. 11° 42' n. and long. 93° e.; has one of the best harbors of Asia, and is a naval rendezvous for military operations in the east.

BLAIR, FRANCIS PRESTON, Sr.: 1791–1876: statesman: b. Abingdon, Va., educated at Transylvania Univ., Ky., took a law course, but never practiced. He had been a supporter of Clay, but in 1828 became a Jackson democrat. In 1829, at the suggestion of Pres. Jackson, he came to Washington and commenced the publication of the *Globe*, the acknowledged organ of the democratic party until 1845, when he was removed from its management by Pres. Polk, who afterwards offered him the em-

bassy to Spain, which he declined. After the Missouri compromise was repealed, 1854, he left the democratic party, and in 1856 was president of the national republican convention at Pittsburgh, drafted its platform, and after refusing to allow the use of his own name as a candidate, gave his influence in favor of Col. Fremont for the presidency. After the death of Lincoln, B., dissatisfied with the general policy of the republicans, again joined the democratic party.

BLAIR, FRANCIS PRESTON, Jr.: 1821-75: son of Francis P. B., Sr.; b. Lexington, Ky. A graduate of Princeton College, he read law in Washington, became a member of the bar in Kentucky, 1843, and began practice in Missouri. For his health he accompanied some trappers (1845) to the Rocky Mountains; soon afterwards he enlisted and served as private in the war with Mexico. In 1848, he became a free-soil democrat, was editor for some time of the *Missouri Democrat*, and from 1852 was during four years a member of the legislature of Missouri. In 1856, he joined the republican party, and was three times elected as its representative in congress. It was largely through his foresight and promptness that Missouri and Kentucky were saved to the union. At the beginning of the war against secession he entered the army as colonel, became brig.gen., 1861, and maj.gen., 1862, Nov. 29. He commanded at Vicksburg, and in the battles of Lookout Mountain and Missionary Ridge, and accompanied Sherman in his famous 'march to the sea.' In 1868, he was the democratic candidate for vice-president; 1871-73, U. S. senator from Missouri. He wrote *The Life and Services of Gen. William O. Butler* (1848).

BLAIR, HUGH: 1718, Apr. 7—1800, Dec. 27: b. Edinburgh: Scotch clergyman and man of letters. He entered the university of his native city, 1730, and while a student wrote an *Essay on the Beautiful*. In 1741, Oct., B. was licensed as a preacher of the Established Church; and after occupying successively the churches of Colessie in Fifeshire, Canongate Church in Edinburgh, and Lady Yester's, he was promoted, 1758, to the highest position attainable by a Scotch clergyman—one of the charges of the High Church, Edinburgh. His discourses, which display little power or originality of thought, and which derived nothing from the delivery of their author, were greatly admired by 'persons of the most distinguished character and eminent rank' in Scotland, on account of their polished style. In 1759, B. commenced a series of lectures on *Composition* to classes in the university; and three years afterwards, a new chair of rhetoric and belles-lettres, with a salary of £70 a year, being created by the crown, B. was made professor. He held this appointment until 1783, when he resigned; and in the same year published his *Lectures*, which obtained a reputation far beyond their merits, and one that time has not sanctioned. His first volume of *Sermons* appeared 1777, with the approval of Dr. Johnson, who had read them: and they were very

BLAIR.

successful. George III. showed his appreciation of them by bestowing on B., 1780, a pension of £200 a year. B. also published three other volumes of *Sermons*, and prepared a fourth, printed after his death. They were all as successful as the first volume. Opinion about their merits has much changed since the date of their publication; they are now considered as moral essays rather than sermons. B.'s critical acumen was not great; he believed in the authenticity of Ossian's poems, which he strenuously defended.

BLAIR, JAMES: 1656-1743; a divine and educator; b. in Scotland, where he was educated and became a clergyman of the Episc. Church. In 1685 he was sent as missionary to Virginia. Perceiving the need of a seminary, he raised by subscription a fund of £2,500, obtained a charter in 1692, and by indefatigable efforts succeeded in founding at Williamsburg, 1693, William and Mary College, of which he was the first president, though he did not officiate in a formal manner until 1729. This institution was not successful at first, as the rich planters preferred to have their sons educated in England. He published *Our Saviour's Divine Sermon on the Mount Explained and Recommended in divers Sermons and Discourses* (1722).

BLAIR, MONTGOMERY. 1813-83; statesman: son of Francis P. B., Sr.: b. Franklin co., Ky. He graduated at West Point, 1835, served in the Seminole war, then studied law, and was admitted to the bar, 1839. In Missouri, where he began practice, he received the appointment of U. S. dist. attorney, was elected mayor of St. Louis, 1842, and served as judge of the court of common pleas, 1843-49. He resigned and removed to Maryland three years afterwards. He was U. S. solicitor, 1855-58; and was removed by Pres. Buchanan, having, like his father and brother, left the democratic party after the repeal of the Missouri compromise. As postmaster-gen. under Lincoln, he introduced postal railroad cars, the money-order system, and free delivery in cities. He resigned, 1864, and returned to the democratic party, whither he was soon followed by his father and younger brother.

BLAIR, ROBERT: 1699-1746; b. Edinburgh, where his father was a clergyman. After completing his education for the ministry, and travelling on the continent, he was ordained, 1731, minister of Athelstaneford, Haddingtonshire, where he continued till his death. He was an accomplished and thoughtful man, gave considerable attention to natural science, particularly botany, and corresponded on friendly terms with several eminent men, among others Watts and Doddridge. To them he submitted the MS. of his poem *The Grave*, which he had written before his ordination. Watts offered it to two publishers, who thought it too heavy for the times, and it remained several years unprinted. It afterwards attained an honorable place in the esteem of those appreciating a forcible, though somewhat gloomy, thought and imagery, applied to a profoundly suggestive and serious theme. It found a con-

genial illustrator in William Blake (q.v.). B. was succeeded in his ministerial charge by the author of *Douglas*. His son, Robert B., of Avontoun, became lord president of the court of session.

BLAIR-GOWRIE, *gow'rī*: village in Perthshire, very picturesquely situated on the e. side of a range of hills, on the right bank of the Ericht, 16 m. n.n.e. of Perth. It consists chiefly of one winding street. It has flax-spinning and weaving factories, driven by the Ericht. Pure white marble is found in the vicinity. There is a branch railway from Cuper-Angus. Pop. (1881) 4,537; (1891) 3,714.

BLAKE, *blāk*, EDWARD: statesman: 1833, Oct. 13—
 —————; b. Adelaide, Ont., Canada; son of William Hume B., jurist (d. 1870). Having graduated at University Coll., Toronto, 1857, he was admitted to the bar 1859, and soon was a distinguished chancery practitioner. Elected, 1867, both to the Ont. assembly and to the dominion parliament, he was from the first a leader in the opposition (liberal) party; was premier of Ontario 1872; successively minister of justice and pres. of the council in the Mackenzie administration 1873-78, and declined the dominion chief-justiceship; both he (1877) and his father (1853) declined knighthood. He was again in the dominion parliament and leader there 1882-89, when he retired from Canadian political life. The Irish constituency of South Longford chose him its representative in the British parliament 1892; his high character, learning, eloquence, experience in public affairs, and his sympathy with the Irish people, make him a valuable auxiliary in the struggle for home rule.

BLAKE, ELI WHITNEY, inventor: 1795, Jan. 27—1886: Aug. 18: b. Westborough, Mass. After graduating at Yale 1816, he began the study of law, but soon left it for employment in his uncle Eli Whitney's gun-factory, Whitneyville, where he invented many improvements in machinery and processes. On Whitney's death 1825, B. associated with himself his bro. Philos B., and another bro., John A. B., 1836. B. Bros. then opened at Westville, Conn., an establishment for manufacturing locks, hinges, latches, etc., and soon commanded the American market for such wares. B.'s capital invention, the stone-breaker, dates from 1857: it is now in use throughout the civilized world. B. was a founder of the Conn. Acad. of Sciences.

BLAKE, GEORGE A. H.: military officer: 1812, Sep.—1884, Oct. 27. He began his milit. career as lieut. 2nd dragoons 1836, June 11; was promoted capt. 1839, Dec., and saw service in the Seminole war 1841. He was engaged in the Mexican war, was brevetted major, appointed maj. 1st dragoons 1850, July, and fought against the Apaches and Navajos. In 1861, May, he was promoted lieut.col. 1st U. S. cav., and col. 1862, Feb. 15; and distinguished himself in several engagements, particularly at Gettysburg, for which conduct he was brevetted brig.gen. 1865, Mar. 13. After the war he commanded at Fort Vancouver, and was retired 1870, Dec. 15.

BLAKE.

BLAKE, GEORGE SMITH: naval officer: 1803-1871, June 24; b. Worcester, Mass. He entered the U. S. navy as midshipman, 1818 Jan. 1; was promoted lieut. 1827, Mar. 31; commander 1847; capt. 1855. He was supt. of the naval acad. at Annapolis, 1858-65; appointed commodore 1862.

BLAKE, HOMER CRANE: naval officer: 1822, Feb. 1—1880, Jan. 21; b. Cleveland, O. He entered the U. S. naval service as midshipman 1840, and was made passed midshipman 1846; promoted lieut. 1855; lieut. commander 1862. He commanded the *Hatteras*, 1863, July 11, when she surrendered to the more powerful rebel cruiser *Alabama*, which sank her. B. commanded the *Utah* 1864, was promoted commander 1866, capt. 1871, commodore 1880.

BLAKE, JOSEPH: colonist: 1620-1700; b. England; son of an English merchant, and bro. of the celebrated admiral Robert B., from whom he inherited a large fortune, much of which he employed in colonizing in the Carolinas. He was an earnest Protestant, and established, 1683, in Charleston, S. C., a considerable number of the best class of emigrants from Somersetshire, England, which led to the extensive settlement of North of Ireland and Prot. English people in that region.

BLAKE, LILLIE (DEVEREUX) (UMSTED): woman's rights agitator: 1835, Aug. 12—————; b. Raleigh, N. C.; descendant of Jonathan Edwards. After preparing at a seminary in New Haven, she took the Yale college curriculum with private tutors. In 1855 she married Frank G. Q. Umsted, lawyer of Philadelphia, who died 1859, leaving her with two children. In 1866 she married Grenfill Blake of New York, and removed thither. In 1869 she began to interest herself in reforms relative to women, particularly as to the right to vote; and became widely known as an able and enthusiastic lecturer and writer on these subjects. She was instrumental in the passage of the N. Y. law giving women in that state the right to vote on school questions; she led in the demand for the admission of women to Columbia coll.; she secured the appointment of police matrons. Advocating her cause Mrs. B. addressed committees of both houses of congress, and of several state legislatures, and spoke before large audiences in many states. As a speaker she is graceful, dignified, earnest, and impressive. She was pres. of the N. Y. State Woman suffrage assoc. 1879-90, and afterward of the New York City Woman suffrage league. She wrote several novels, notably *Fettered for Life* (1873); and her vigorous lectures in 1883 in reply to the Lenten discourses on Women by Morgan Dix, D.D., published under the title *Woman's Place To-day*, had great circulation. She published *A Daring Experiment*, vol. of short stories, (1894).

BLAKE, ROBERT: 1598-1657; b. Bridgewater, Somersetshire, Eng.: celebrated admiral, who, more than any other, contributed to render England mistress of the sea. He was the son of a merchant. An ardent republican, and a man of blunt, straightforward manners, singularly devoid of fear, and of inflexible character, he was much respected by Cromwell, with whom, however, he had no

great intimacy. When the civil war broke out, he raised a troop in Somersetshire, and took part in all important actions against the royalists of the western counties. In 1644, he surprised Taunton, of which place he was made governor, and in that capacity gave proof of military skill. In 1649, in conjunction with two other officers of equal rank, he was appointed General of the Sea, the two services at that time not being distinct, as they are now. This was B's true sphere, and in it he soon showed transcendent ability. After destroying, with the exception of two vessels, the squadron of Prince Rupert, which had sought safety in the Tagus, 1651, B. forced the royalists to surrender Guernsey, Jersey, and the Scilly Isles. In 1652, March, he was made sole admiral of the fleet for nine months, and during this year he fought four engagements with Dutch fleets under Tromp, Ruyter, and De Witt. In the first, May 19, the Dutch retreated under cover of darkness, with the loss of one man-of-war captured, and another sunk. In the next engagement, a squadron of 12 ships, sent to protect the herring-vessels from the attacks of B., were captured; and in the third, Sep. 28, three Dutch vessels were destroyed, and the rear-admiral taken. Nov. 29, a fleet of 80 vessels under the command of Van Tromp, encountered B. with only 40, off the Goodwin Sands. The Englishman scorned to fly even from odds so overwhelming, and the result of the action was the loss of six of his ships—two captured, and four destroyed; the rest, in a shattered condition, sought safety in the Thames. Van Tromp now committed that foolish act of bravado with which his name is associated—he tied a broom to the mast-head of his vessel, and sailed through the Channel, intimating that he had swept English vessels out of it. But, 1653, Feb., the indomitable B. was at sea again with 80 ships, and falling in with Van Tromp with about an equal force, he at once attacked him, and after a three days' running-fight, the Dutchman was fain to seek shelter in the shallow waters of Calais—where the greater draught of the English ships did not admit of their following—with a loss of 11 men-of-war, and 30 of a fleet of merchantmen he had in convoy. The English lost only one ship. On June 3, 4, B. and his coadjutors, Deane and Monk, won another victory over Van Tromp; but ill-health prevented B. from taking part in the engagement of July 29, which finally shattered the naval supremacy of Holland. In 1654, B. was appointed by Cromwell to command an English fleet in the Mediterranean, where he soon made the British flag respected by Dutch, Spanish, and French alike. The dey of Tunis refused to do it reverence. B. attacked his capital, burned the Turkish fleet of nine ships which lay before it, accomplished a landing, and with a body of about 1,000 men annihilated an army of 3,000 Turks. He next sailed to Algiers and Tripoli, landed, and set free all the English who were detained as slaves. He concluded alliances highly favorable to England with Venice and Tuscany. In 1657, he defeated the Spaniards at Santa Cruz. This was perhaps one of the most daring actions in B's memorable career. With a wind blowing right into the bay—which was very strongly defended—B.

BLAKE—BLAKELEY.

dashed in, attacked and destroyed the Spanish galleons and shipping in the harbor, and, the wind fortunately changing, sailed out again with a loss of only one ship and 200 men. The Spanish loss in men and property was immense, and the terror the action inspired insured increased respect to the English flag. His health now failed; he returned to England, and died as his ship entered the harbor of Plymouth. Cromwell honored his memory by a solemn funeral procession, and caused him to be interred in Westminster Abbey. His skill and courage were equalled only by his disinterested patriotism, sterling honesty, and love of justice; he not only gained a decided superiority over England's mightiest naval opponent, but, by the bold tactics that he introduced, infused that spirit of enterprise which has ever since distinguished the British navy.

BLAKE, WILLIAM: 1757, Nov. 28—1827, Aug. 12; b. London: engraver and poet. In 1789, he published *Songs of Innocence and of Experience, showing the Two Contrary States of the Human Soul*, with about 60 etchings, remarkable for their peculiar and original manner. The poems were equally singular, but many of them showed true pathos. Some marginal designs for Young's *Night Thoughts*, executed by B., were greatly admired by Flaxman. B. lived in the full belief that he held converse with the spirits of the departed great—among others, with those of Moses, Homer, Virgil, Dante, and Milton. He published numerous etchings, chiefly of religious and cognate subjects, among the best of which are his *Illustrations of the Book of Job*, and the illustrations of Blair's *Grave*. He died in poverty and obscurity, with the conviction that he was a martyr to poetic art. Charles Lamb regarded him as 'one of the most extraordinary persons of the age;' and A. C. Swinburne said of him that he was 'the single Englishman of supreme and simple poetic genius of his time.' See *Life of B.*, by Alex. Gilchrist (1863); *William B.*, by Swinburne (1868); and *Poetical Works*, edited by W. M. Rossetti (1874).

BLAKE, WILLIAM PHIPPS, PH.B.: mineralogist: 1826, June 1———; b. New York. He graduated at Sheffield scientific school, Yale Univ., 1852, and immediately was employed on the Pacific railroad survey; was editor of the *Mining Magazine* 1859–60; mining engineer for the Japanese govt. 1861–63; then prof. of mineralogy in the Cal. Univ. He was commissioner of Cal. at the Paris exposition 1867; special agent to the Vienna exposition 1872; executive commissioner of the Centennial exhibition 1876. In 1900 he was made director of the School of Mines in the University of Arizona, and also territorial geologist.

BLAKELEY, blāk'lē, JOHNSTON: naval officer: 1781–1814; b. near Seaford, co. Down, Ireland. When he was 2 years of age, his father emigrated with him to America and settled in Wilmington, N. C. B. was at school in New York 1790–92; then entered the Univ. of N. C.; but his father dying 1797, the lad, left alone in the world, gave up his studies to earn a livelihood. He was appointed mid-

BLAME—BLANC.

shipman 1800, lieut. 1807. In the war of 1812, commanding the brig *Enterprise*, he rendered good service, guarding the coast, till, being appointed master commander, he was assigned to the sloop *Wasp*. On a cruise, the *Wasp* encountered the British brig *Reindeer*, and after a desperate hand to hand struggle, the British vessel struck her colors. B. burned the prize and sailed for L'Orient. Homeward-bound he captured and sank many vessels; but the *Wasp* never returned.

BLAME, v. *blām* [F. *blâmer*, to blame—from Norm. F. *blasmer*—from L. *blasphemārē*, to revile, to defame, to blame: Ger. *blasphēmeîn*, to speak impiously, to defame]: to find fault with; to censure: N. censure; crime; expression of disapprobation; reproach. To **BLAME**, in fault; blameworthy, as they are *to blame*. **BLA'MING**, imp. **BLAMED**, pp. *blāmd*. **BLAME'WORTHY**, a. *-wēr-thī*, worthy of blame or censure; culpable. **BLAME'WOR'THINESS**, n. **BLAME'FUL**, a. *-fūl*, meriting blame. **BLAME'FULLY**, ad. *-fūl-ī*. **BLAMEFULNESS**, n. **BLA'MER**, n. one who. **BLAMABLE**, a. *blā'mă-bl*, deserving of censure; faulty; culpable. **BLA'MABLY**, ad. *-blī*. **BLA'MABLENESS**, n. *-bl-nēs*, the state of being worthy of blame. **BLAMELESS**, a. *blām'les*, without fault; innocent; free from blame; guiltless. **BLAME'LESSLY**, ad. *-lī*. **BLAME'LESSNESS**, n. state of being free from fault or blame; innocence.—**SYN.** of 'blame, v.': to condemn; reproach; chide; censure, reprove; upbraid; animadvert; rebuke; reprimand;—of 'blame, n.': fault; sin; censure; reprehension; crime; condemnation; reproach;—of 'blameless': innocent; faultless; guiltless; spotless; stainless; irreproachable; unblemished; unspotted.

BLANC, *blōng*, JEAN JOSEPH LOUIS: 1811, Oct. 29—1882 Dec. 6; b. Madrid, Spain: French socialist and historian. In 1820, he was placed in the college at Rhodéz; in 1830, he went to Paris, and became a clerk in an attorney's office; but in 1832, became tutor of the son of M. Hallette, of Arras. Here he resided for two years, contributing largely, on literary and political subjects, to the *Progrès du Pas-de-Calais*. He afterwards went to Paris, where he contributed to various political papers, and where, 1838, he founded the *Revue du Progrès Politique, Social et Littéraire*, in which he laid down in a more quiet and leisurely way his socialistic theory. In this he brought out his chief work on Socialism, the *Organisation du Travail*, which, 1840, appeared in a separate form. The book obtained for its author a wide, enthusiastic popularity among the French *ouvriers*, who were captivated by the brilliancy of the writing, the symmetrical simplicity of the scheme, and the freshness of the views advocated. The book denounces the doctrine of individualism—i.e., individual and competitive efforts in labor—and advocates the absorption of the individual in a vast 'solidarity,' where 'each would receive according to his needs, and contribute according to his abilities.' B. next published (1841–44) a historical work entitled *Révolution Française: Histoire de Dix Ans, 1830–40*, which produced a deadly effect on the Orleans dynasty. Louis Philippe afterwards declared that 'it acted like a

BLANC.

battering-ram against the bulwarks of loyalty in France.' It owed its success partly to the exposure it gave of the scandalous jobbery and immorality of the crown and its advisers, partly to its passionate vehemence, and partly to its academic pomp of style. This was followed by the first vol. of a *Histoire de la Révolution Française*, in which the author's aim was not only to describe, from his own point of view, the incidents of the first revolution, but the social history of the 18th c. On the breaking out of the revolution of 1848, Feb., B. seemed likely to be a leader. His connection with the party of the *Réforme* journal, and his popularity with the working-classes, led to his being appointed a member of the provisional government. He was placed at the head of the great commission for discussing the problem of labor. At the same time, Marie, minister of public works, began—but without B.'s co operation—to establish the so-called national workshops (see *ATELIERS NATIONAUX*) which were to realize the socialistic principle, but which only proved the hazardous and impracticable character of B.'s doctrines. The national workshops led to the arrest of 1848, May 15, when B. nominally, if not actually, again was prominent. A proposal was made to prosecute him, but it was negatived by the national assembly. After the June insurrection, he was again accused, and prosecuted for conspiracy, but contrived to escape to London, where he spent many years. During his exile, he devoted himself to political and historical literature. In 1849 appeared his *Appel aux Honnêtes Gens*, and *Catéchisme des Socialistes*; in 1850, *Pages d'Histoire de la Révolution de Février*; and in 1851, *Plus de Girondins; la République Une et Indivisible*. The work which has secured him the most enduring reputation is his *History of the French Revolution*, written during his residence in England. It is characterized by extensive and original research, which has frequently enabled the author to reverse the common verdicts on historical personages, and to disprove many of the extravagant stories of the stormy period of which it treats. In style, it is eloquent, bold, and dignified; and while its sentiments do not always commend themselves to sober judgment, there can be but one opinion in regard to its candor, impartiality, and power. On the fall of the empire, B. returned to France, was chosen to the national assembly 1871, and sat for Paris till his death. He voted usually with the extreme left.

BLANC, LE, *lû-bläng'*: town of France, dept. of the Indre, with a beautiful situation on the Creuse, which divides the town into two parts, about 32 m. w.s.w. of Châteauroux. Above B., the river expands so as to form a lake, but at the town it contracts, and breaks into cascades with sufficient fall to turn the machinery of several manufactories. B. is a thriving place, with cloth and linen yarn mills, potteries, tanneries, vinegar-works, forges, etc. It is very ancient, having been frequented by the Romans. It was formerly strongly fortified, but the fortifications are dismantled. Pop. (1886) 5,724. (1891) 7,140.

BLANC, MONT: see MONT BLANC.

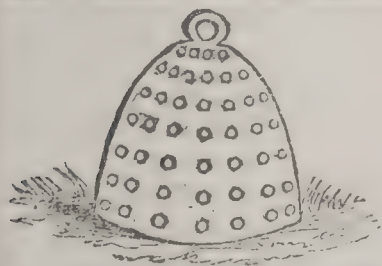
BLANCH—BLANC-MANGE.

BLANCH, v. *blānsh* [F. *blanchir*, to whiten—from *blanc*, white—from O.H.G. *blanch*: Dan. *blank*, shining, polished]: to make white; to take out the color. **BLANCHING**, imp.: **ADJ.** becoming pale or white; whitening: **N.** the operation of brightening pieces of silver, or of making other metals white like silver; the operation of whitening vegetables by covering them from the light. **BLANCHED**, pp. *blānsh't*. **BLANCHER**, n. one who.

BLANCHE FERME, *blānsh fērm* [F. *blanche*, feminine form of *blanc*, white; *ferme*, a farm; AS. *feorm*, what goes to support life: mid. L. *firma*, money, rent]: a phrase denoting an acknowledgment of vassalage by the payment of a sum of white money or silver, instead of victuals. **BLANCH-HOLDING**, or **BLENCH-HOLDING**, a tenure by which the tenant is bound to pay only a trifling or elusory duty; on abolition of ward-holding, all lands held of the crown were converted into *blanche*-holding (see **CHARTER: TENURE OF LAND**). **BLANCH-FARM**, in *OE.*, an annual rent or duty paid to the lord of the manor.

BLANCHE-LYON, *blānsh lē ōn'*: title of one of the English pursuivants-at-arms: see **PURSUIVANT**.

BLANCHING, in Gardening: a process to prevent certain secretions which in ordinary circumstances take place in the leaves of plants, and to render them more pleasant and wholesome for food. The action of light is indispensable to the decomposition of carbonic acid by the leaves of plants, and, consequently, to the elaboration of many of the substances from which they derive their peculiar qualities: the exclusion of light, therefore, not only makes the stalks and leaves of plants white or nearly white, but also modifies their qualities, and, as in sea-kale and celery, makes quite palatable plants which are naturally coarse and bitter. B. is accomplished in various ways according



Blanching-pot.

to the position of the plant which it is desired to keep free from color. In England the leaves of plants of certain varieties of lettuce are tied together and thus the inner ones are imperfectly blanched. Sea-kale (q. v.) is here usually blanched by covering the crowns with sand, or inverted flower pots, but in Europe a perforated earthenware pot, represented in the illustration, is used to some extent. Celery (q. v.) of which the stalks are to be blanched is banked with earth at different times during the season. The use of boards for this purpose is a comparatively recent method which is growing in popularity. In cabbage and other plants whose leaves form compact heads, there is a natural B. or etiolation.

BLANC-MANGE, n. *blāng-mōngzh'*, or simply *blā-mōngzh'*, also **BLANCMAN'GER**, n. *-zhā* [F. white food or jelly]: a confectioned white jelly. **BLANC FIXE**, n. *blāng fīks* [F. *fixe*, fixed, firm]: a white paint composed of sulphate of barium

BLANC-MANGE--BLAND.

BLANC-MANGE: so called from its white appearance; jelly made of isinglass and milk. The following is the ordinary recipe for making it. Take a quart of sweet milk or cream, and put in it two ounces of the best isinglass, with the rind of a lemon, a blade of mace, and white sugar to taste. Put the whole in a saucepan, and let it boil a quarter of an hour; then mix with six bitter almonds and 24 sweet ones, beaten into a paste with a little water; strain through a piece of muslin; and having let the composition settle a little, pour into a mold, and turn it out when cold. Soyer gives one ounce of isinglass to a quart of milk, a quarter of a pound of sugar, a quarter of an ounce of cinnamon, a little grated nutmeg, half of the peel of a lemon, and a bay-leaf, prepared as above. B. is also made of calf's-foot jelly and eggs, of arrow-root and milk, etc.; and the flavor is modified to taste.

BLANCO, *blán'kō*, **CAPE:** remarkable headland on the w. coast of Africa; lat. 20° 47' n.; long. 16° 58' w.; the extremity of a rocky ridge (called Jebel-el-Bied, or White Mountain) which projects from the Sahara in a westerly direction, and then bending s. forms a commodious harbor called the Great Bay. The bay and town of Arguin, supposed to have been the limit of ancient navigation in this direction, lie some miles south. Southward to the mouth of the Rio Grande the shores are low and sandy, with a current tending s.w., and prevalent n.e. trade-wind; n. from Cape B. to Cape Geer, the coast is rocky, with a moderate elevation. On account of the deficiency of good harbors, the prevalence of w. winds, and other causes, the casualties to shipping are very numerous. The constancy of w. wind on a coast almost wholly within the sphere of the trade-winds, is very remarkable, and is accounted for by the rarefaction of the air by the heat of the sands of the Sahara. The natives of the Canary Islands carry on a lucrative fishery in the bay in boats of from 100 to 150 tons. Cape B., which is composed of mixed calcareous and silicious sandstone, was discovered by the Portuguese, 1441.

Cape B. is also the name of several less important headlands in Spain, Greece, America, and the Philippines.

BLAND, RICHARD PARKS: an American legislator; b. 1835, Aug. 19; practised law in Missouri, California, and Nevada, and for some time engaged in mining. He settled in Lebanon, Mo., in 1865; was a member of congress in 1873-95 and 1897-99; and was a candidate for the presidential nomination at the democratic national convention in 1896, but his name was dropped on the fourth ballot, and the vote of his state was given to William J. Bryan. Mr. Bland was known as the author of the Bland Silver Bill and as the leader of the free-silver movement in the house of representatives. D. 1899, June 15.

BLAND, THEODORIC: 1742-90: revolutionary soldier; b. in Prince George co., Va. At the age of eleven he was sent to Wakefield, England, to receive his preliminary education. After completing the medical course at the Edinburgh Univ. he practiced medicine in England until

BLANDFORD—BLANDRATA.

1764, when he returned to America. He assisted in removing from Dunmore's palace the arms and ammunition which that officer had taken from the arsenal, and afterwards gave vent to his indignation against the governor in a series of letters signed 'Cassius.' He was capt. of the first troop of cavalry of Virginia, became lieut.col. (1777), later col.; was an excellent officer, having the confidence of Washington throughout the war. As member of the Virginia convention of 1788, he opposed the adoption of the federal constitution. In 1789, Mar. 30, he took his seat as representative in the first congress. He died during its sessions the next year, and was buried in Trinity churchyard, New York.

BLANDFORD, or **BLANFORD**: town in the s.w. of Mass. (Hampden co.) abt. 5 m. w. of the Westfield river and 20 m. w.n.w. of Springfield. Having an elevation of abt. 2,000 ft., with pure air and picturesque views, it has become a favorite summer resort. It has manufactures and a public library. Pop. (1890) 871; (1900) 836.

BLANDFORD-FORUM, or **MARKET BLANDFORD**: town in Dorsetshire, on the right bank of the Stour, 16 m. n.e. of Dorchester; in a fine tract of pasture-land, famed for its multitude of cows. It suffered much in 1579, 1677, 1713, and 1731, from fire. It is built of brick, and is neat and regular. It was formerly famed for its manufactures of bandstrings and lace, the point-lace bringing £30 a yard. Shirt-buttons are made here. Pop. (1871) 4,011; (1881) 3,753; (1891) 3,974.

BLANDISH, *v.* *blăn'dîsh* [OF *blandissant*, blandishing—*from* OF. *blandir*, to flatter—*from* L. *blandîrî*, to caress—*from* *blandus*, gentle]: to caress; to flatter by caresses; to soothe; to soften. **BLAN'DISHER**, *n.* one who **BLAN'DISHING**, *imp.* **BLAN'DISHED**, *pp.* *-dîsh-t*. **BLAN'DISHMENT**, *n.*, and **BLAN'DISHING**, *n.* soft words tending to win the heart; caresses.

BLANDRATA, *blăn-drâ'tâ*, **GIORGIO**: d. 1590; b. Saluzzo, Italy: founder of Unitarianism in Poland and Transylvania. He had established himself as a physician at Pavia, when he was compelled, on account of his heretical opinions, to fly to Geneva in 1556, where at first, and to avoid further molestation, he feigned to agree with Calvin. In 1558, he went to Poland; hoping to find there greater freedom of thought and speech; and in 1563 he betook himself to the court of John Sigismund, Prince of Transylvania, whose favorite physician he became. Here he exerted himself prudently but assiduously to spread his doctrines, and succeeded in forming a considerable party. In his old age, however, the heat of his proselytizing zeal died out; and it is asserted that, to preserve his worldly interests, he even forsook the cause of the Unitarians, and favored the Jesuits, who were in high esteem with the prince. He was murdered by his nephew, whom he had threatened to disinherit on account of his attachment to the Rom. Cath. Church. B.'s religious treatises are destitute of importance.

BLANE—BLANKET.

BLANE, Sir GILBERT: 1749, Aug. 29—1834, June 26: b. Blane-field, Ayrshire. physician. He studied at Edinburgh Univ., and became private physician to Lord Rodney, whom he accompanied in 1780, when Rodney took command of the West Indian squadron. On one occasion, when all the officers were wounded, B.'s bravery was so conspicuous, that Lord Rodney immediately obtained for him the appointment of physician to the fleet. In 1785, he was elected physician to St. Thomas's Hospital, London, having previously been appointed physician-extraordinary to the Prince of Wales. In 1795, he was chosen head of the navy medical board. In 1812, he had a baronetcy conferred upon him, and in the same year the prince regent made him his physician in ordinary. When the Duke of Clarence ascended the throne as William IV., 1830, he made B., then 81 years old, his first physician. He published several valuable works, the most popular and useful of which are, *Observations on the Diseases of Seamen*, a lecture on *Muscular Motion*, and *Elements of Medical Logic*.

BLAÑES, *blán'yès*: town of Spain, province of Gerona, 22 m. s. of the city of Gerona, with a port on the Mediterranean. Pop. 5,000.

BLANK, a. *blāngk* [F. *blanc*, white; Dan. *blank*, shining; Ger. *blinken*, to shine]: white; denoting an unwritten ticket, or one not obtaining a prize; empty; void; confused; confounded, as applied to looks or countenance; in *verse*, without rhyme. N. a void; any empty space; paper unwritten on or without marks; a ticket without value: V. to make void or empty; to confuse; to efface or rub off. **BLANK'ING**, imp. **BLANKED**, pp. *blāngkt*. **BLANK'LY**, ad. -*lī*. **BLANK'NESS**. n. state of being blank; confusion. **BLANK CARTRIDGE**, one filled with powder only: see **CARTRIDGE**. **FIRING BLANK**, discharging a cannon or gun loaded with powder only. **POINT-BLANK**, the shot of a gun levelled horizontally, the shot proceeding in a straight line without curving.

BLANK BONDS: Scotch securities, in which the creditor's name was left blank, and which passed by mere delivery, the bearer or holder being at liberty to insert his name in the blank space, and sue for payment. They were discarded, 1696, for liability to fraud.

BLANKENBURG, *blán'kén-bûrg*: town in the duchy of Brunswick, 37 m. s.e. of the capital; on the borders of the Harz Mountains, 732 ft. above the sea. It has a gymnasium, and several charitable and educational institutions. The people are engaged largely in mining, iron, marble, and dye-earths being plentiful in the surrounding districts. On the Blankenstein, a rocky height immediately adjoining the town, there is a palace belonging to the Duke of Brunswick; and on the lofty summit of the Regenstein, about half a mile distant, there are the remains of a large castle, with many chambers, hewn out of the rock by Henry the Fowler in 919. Louis XVIII. resided at B. as Comte de Lille, 1796-98. Pop. (1885) 6,010; (1890) 7,703.

BLANKET, n. *blāngk'èt* [OF. *blanket*, and *blanchet*, a

BLANK VERSE—BLANQUI.

white woolen cloth, a blanket—from *blanc*, white]: a soft, coarse, lightly woven, woolen cover for a bed: V. to toss in or cover with a blanket. BLANK'ETING, imp.: N. cloth for blankets. BLANK'ETED, pp. WET BLANKET, a damper for fire; any thing or person tending to cool ardor; a sore discouragement

BLANK VERSE: verse without rhyme (q.v.), and depending upon metre (q.v.) alone. The classical productions of the Greek and Roman poets—at least such as have come down to us—are composed on this principle; accordingly, when the passion for imitating classical models set in, rhyme came to be looked upon as an invention of Gothic barbarism, and attempts were made in most countries to shake it off. The first specimen of blank verse in English is a translation of the second and fourth books of Virgil's *Æneid*, by the Earl of Surrey, who was put to death 1547; but it had been used by Italian and Spanish writers as early as about the beginning of the 16th c. In England, its adaptation to the drama was at once felt, and in that department of poetry it soon became and has continued dominant—if we except the effort made by Dryden and others, after the Restoration, to return to rhymed plays: but in other kinds of poetry, it was not till the appearance of *Paradise Lost* (1667) that it could be said to have taken root; and even then the want of rhymes was felt, as the poet expected it would be. Many poets have followed Milton's example; and English narrative, didactic, and descriptive poetry, is partly in B. V., partly in rhyme. It is chiefly in 'heroic' metre, as it is called—that is, in verses or lines of ten syllables—that blank verse has found a firm footing. Some, in fact, would restrict the name blank verse to lines of ten syllables, not considering it applicable to such metres as those of Southey's *Thalaba* and Longfellow's *Hiawatha*.—Dramatic B. V. is characterized by the frequent occurrence of a supernumerary syllable at the end of the line:

To be | or not | to be, | that is | the ques|tion:
Whether | 'tis no | bler in | the mind | to suf|fer.

In Italian and Spanish, B. V. never became popular, and still less in French. The German language seems to admit every variety of blank metre.

BLANQUI, *blón-ke'*, JÉRÔME ADOLPHE: 1798, Nov. 28—1854, Jan. 28; b. Nice: one of the first French economists. He was educated at the Lyceum of Nice. In 1814, young B. went to complete his studies at Paris, where he became acquainted with J. B. Say, who induced him to study political economy. In 1825, by Say's recommendation, he was appointed prof. of history and of industrial economy in the Commercial School at Paris. On the death of Say, he was appointed prof. of industrial economy in the Conservatoire des Arts et Métiers, and was one of the editors of the *Dictionnaire de l'Industrie Manufacturière, Commerciale, et Agricole*. In 1838, June, he became a member of the Acad. of Moral and Political Science. The Acad. sent him to Corsica, to study the condition of that country; and, 1839, to Algiers for the same purpose. In 1841, he

BLANQUI—BLAPS.

visited Turkey. In 1851, the Acad. requested him to furnish a complete account of London in its financial and other aspects. He died at Paris. B. as a national economist, was somewhat inclined to socialism. Like his master, Say, he was in favor of free-trade. In method, he is ingenious; in style, transparent; and even the dryest discussions become interesting, from his lively mode of treating them. His principal works are—*Voyage d'un Jeune Français en Angleterre et en Ecosse* (Paris, 1824); *Résumé de l'Histoire du Commerce et de l'Industrie* (Paris, 1826); *Précis Élémentaire d'Économie Politique, précédé d'une Introduction Historique, et suivi d'une Biographie des Économistes*, etc. (Paris, 1826); and, most important of all, the *Histoire de l'Économie Politique en Europe, depuis les Anciens jusqu'à nos jours, suivie d'une Bibliographie raisonnée des Principaux Ouvrages d'Economie Politique*.

BLANQUI, LOUIS AUGUSTE: 1805, Feb. 7—1881, Jan. 1; bro. of Jérôme Adolphe B. He made himself conspicuous, chiefly by rabid advocacy of extreme political opinions. From an early age, he dabbled in conspiracy, and submitted to its penalties with the pride of a martyr. After the revolution of February, he formed the Central Republican Soc., which menaced the existence of the provisional govt. He it was also who organized the revolutionary *attentat* of May 15, the aim of which was to overthrow the constituent assembly. At the head of an excited mob, he made his appearance before the national representatives, and with that melodramatic tendency to emancipate the world which is not unknown to the French patriot, demanded the *resuscitation of the Polish nationality!* His coadjutor, M. Huber, went a step further, and pronounced the dissolution of the assembly. The latter fortunately proved itself strong enough to crush this insolence. B. was arrested, and condemned to ten years' imprisonment in Belleisle. In 1861, he was sentenced to other four years' imprisonment. He appeared again as one of the most active spirits in the red republican movement of 1870-1, and once more became a prisoner of state.

BLAPS: genus of insects, of the order *Coleoptera*, type of a tribe called *Blapsides*, the species of which are numerous, all of dark color, destitute of wings, and having the elytra or wing-cases united together. They run slowly, however, in comparison with many kinds of beetles, and inhabit dark and damp situations, feeding chiefly on dead vegetable matter. They have the power of secreting and emitting a brownish, acrid, irritating fluid, of a peculiar and penetrating odor, with which they appear to be furnished for the purpose of self-defense, and which some of them are capable of throwing to a distance of six or eight inches. *Blaps mortisaga* is a com



Blaps mortisaga.

mon British species, of about an inch long, and of a shining black color. It is sometimes called DARKLING BEETLE, and CHURCH-YARD BEETLE, sometimes seems to share with the Cockroach (q.v.) the appellation of BLACK BEETLE. It is a frequent companion of the cockroach in pantries and cellars.—*Blaps sulcata* is cooked with butter and eaten by Turkish women in Egypt, under the notion that it will make them fat, this being in their estimation, one of the chief points of beauty.

BLARE, n. *blār* [Dut. *blaeren*, to bubble; to blister. Gael. *blor*, a loud noise]: a roar; a bellowing noise: V. to bellow; to roar. BLA'RING, imp. BLARED, pp. *blārd*.

BLARNEY, n. *blār'nī* [from a legend connected with *Blarney Castle*, 4 m. n.w. of Cork, Ireland: comp. Gael. *bladhair*, to flatter; *nighean*, the girl]: cajoling talk, especially in courting a woman; smooth deceitful talk; flattering untruthful words. On the top of the tower of Blarney Castle (built 1449 by Cormac McCarty) is the Blarney stone, which, if kissed, is fabled to endow with the gift of wheedling and cajoling.

BLASÉ, a. *blá'zā* [F. *blasé*, cloyed—from *blaser*, to pall, to blunt: comp. Gael. *blas*, taste, flavor]: rendered incapable, by excess, of further enjoyment: N. one rendered incapable by excesses of further enjoyment. BLASES, n. plu. *blá'zāz*.

BLA'SIUS: d. 316: saint and martyr; Bishop of Sebaste, in Cappadocia, when Licinius began a bloody persecution of the Christians. B. left the town, and concealed himself in an unknown chasm in the rocks, but his abode was discovered by Agricola, while hunting. The saint was conveyed to Sebaste, and as he steadfastly refused to deny Christ and worship the heathen gods, he was put to death with most horrid cruelty. At one period his worship must have been widely diffused, judging from the extent of territory over which his relics were scattered. The wool-combers claim him as their patron, for the singular reason that he was tortured, among other instruments, with a wool-comb. At Bradford, in Yorkshire, there is a septennial procession of that craft on his day, Feb. 3. The practice of invoking St. B. in cases of sore throats is said to have originated in the circumstance that, when young, he saved the only son of a rich widow from being choked by a fish-bone. It has been conjectured, however, that the wool-comb has probably been mistaken for a fish-bone, and that the story of the rich widow's only son is a myth elaborated in explanation of the circumstance.

BLASPHEME, v. *blās-fēm'* [F. *blasphémer*—from L. *blasphēmūrē*, to revile, to defame—from Gr. *blasphēmēin* (see BLAME)]: to speak of God with irreverence; to speak in impious terms of any of God's names and attributes; to curse or swear; to speak abusively. BLASPHE'MING, imp. BLASPHEMED', pp. *-fēmd'*. BLASPHE'MER, n. one who. BLASPHEMOUS, a. *blās'fē-mūs*, impious; containing blasphemy. BLAS'PHEMOUSLY, ad. *-ūs-lī*. BLASPHEMY, n.

bläs'fē-mī, irreverence in speaking of God; profane language.

BLASPHEMY: an offense against God and man, by denying to the Almighty his being and providence; or by contumelious reproaches of the Lord and Saviour Jesus Christ; also all profane scoffing at the Holy Scriptures, or exposing them to ridicule and contempt. Moreover, in England, seditious words in derogation of the established religion may be proved under a charge of blasphemy. These all are offenses punishable at common law by fine and imprisonment, or other infamous corporal punishment; for Christianity is held to be part of the laws of England; and a blasphemous libel may be prosecuted as an offense at common law, and punished with fine and imprisonment. In *Gathercole's case*, tried at York, 1838, where the defendant, a clergyman of the Church of England, was prosecuted for a libel on a Rom. Cath. nunnery, and in which he also made a violent attack on the tenets and the morality of the Rom. Cath. Church, it was laid down by the judge who tried the case (the late Baron Alderson), that a person may, without being liable to prosecution for it, attack Judaism, or Mohammedanism, or even any *sect* of the Christian religion, save the established religion of the country; and the only reason why the latter is in a different situation from the others is, because it is *the form established by law*, and is therefore a part of the constitution of the country. But any general attack on *Christianity* is also the subject of criminal prosecution, because Christianity is the public religion of the country. Thus, in England, as an offense against religion, B. may assume one of two forms: first, either as against the articles and creeds of the Established Church; or secondly, as against a dissenting community, in the libel against whom a general attack on the Christian religion is involved. The B. must in some manner have been overtly and publicly declared, either by a speech on some public occasion, or by the act of publication in print.

The Scotch law regarding this offense is now much the same. The old severe Scotch acts, one passed 1661, another 1695, which provided capital punishment for offenses of this description, were repealed by the 53 Geo. III. c. 160.

In the United States B., is a misdemeanor at common law; and various statutes define punishment for it. It is defined as an intentional use of words fitted to destroy the reverence and trust due to Almighty God as the Creator, Preserver, and Ruler of the world; but an attack on any organized church, as such, is not B. in law; nor is a sober discussion denying the existence of God. In many states gross profaneness is held to involve a less degree of B.; but the enforcement of this law is infrequent. As to the grounds of our laws against B., it is generally conceded that in a Christian land the open contumely of God is an offense against public peace and order—invading the rights of the *citizens*. That, behind this, the law also retains from former times a purpose to assert the right of *God* to

BLAST—BLAST FURNACE.

be revered, is asserted by some, and utterly denied by others.

BLAST, n. *blāst* [AS *blæsen*, to blow; *blest*, a blast; Icel. *blastr*, a breath]: a violent rush of wind; the sound of a wind instrument; any influence destructive of life; an explosion of gunpowder; the air introduced into a furnace: **V.** to cause to wither; to blight; to affect with a sudden calamity; to destroy; to confound; to split rocks by gunpowder. **BLASTING**, imp.: **N.** the act of separating stones or rocks from their beds by blowing them up with gunpowder. **BLASTED**, pp.: **ADJ.** accursed; detestable; made infamous; affected by some cause injurious to growth or life. **BLASTER**, n. one who or that which. **BLAST-MACHINE**: see **BLOWING-MACHINE**. **BLAST-PIPE**, the waste-steam pipe in locomotive engines, of prime importance in causing a greater draught in the fire-tubes and through the fire-grate. **BLAST-FURNACE**, a furnace for smelting iron ore, etc., whose heat is vastly increased by air, generally heated, being forced into it by machinery—the air so introduced is called *the blast*. **BLAST-HOLE**, the induction water-hole at the bottom of a pump-stock.

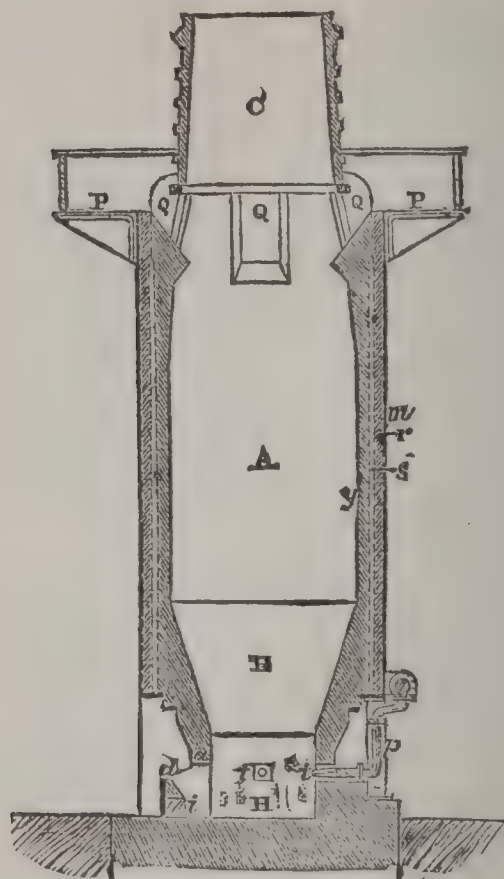
BLASTEMA, n. *blās-tē'mā* [Gr. *blastēma*, a sprout, offspring—from *blastāno*, I germinate]: in *surg.*, a sub-transparent glairy matter, containing a multitude of minute corpuscles forming the basis of part of an animal, as the *blastema* of bone—an obsolete term for *protoplasm*; in *bot.*, the whole of the embryo after the cotyledons have been abstracted. **BLASTEMAL**, a. *-māl*, pertaining to; rudimentary.

BLAST FURNACE: smelting furnace in which the heat is increased by a blast of air forced in by mechanism. Many costly experiments have been tried of late years in order to determine, with other related questions, the best form of the blast furnace in which iron is smelted. Which is the most serviceable form is as yet a much-disputed point; but, according to the published accounts, furnaces of the unusual height of 80 to 100 ft. give, as a rule, the best results. There are two types of blast furnaces, irrespective of differences in their forms, as regards the way in which they are constructed. Some are built with thick walls, either entirely of brick or of brick and stone, hooped with iron, forming massive towers. Others are formed of comparatively thin brick walls, and depend for their strength on an outer malleable iron casing, in which case they are called *cunola* furnaces. See **IRON**, Fig. 1, furnace A, for an example of the the former; the annexed figure represents one of the latter kind.

The various parts of the furnace are distinguished as follows: A is the *shaft* or *body*, generally either in the form of a cone or cylinder, or somewhat barrel-shaped, in which case, the portion marked B is not distinguishable from the shaft. B is called the *boshes*, and is the part of the furnace which, from the high heat to which it is exposed, usually gives way first. H is the *hearth*, and C is the *tunnel-head*, which, however, is usually wanting when

BLAST FURNACE.

the mouth is closed by a bell and cone to save the gases generated in the furnace. P is the charging platform, and Q, Q, the openings through which the ore, fuel, etc., are fed. These materials are brought to the platform by hoists, inclines, or level gangways, according to the situation of



Blast Furnace.

the furnace. Just below the boshes there are four or five openings in the circumference for the *tuyeres t*, and another for the arrangements required for tapping the furnace. As respects the latter, *a* is calling the *tump-arch*, immediately below which is placed the *tump* itself, consisting of a rectangular iron box containing water in a coiled pipe. The hearth is prolonged in the direction of the *damp-plate d*, and the space between it and the *tump* is filled up with sand or clay, in which there is a channel for the escape of slag. In the *damp-plate* is placed the *tapping-hole, i*, through which the molten iron is run off. The pipe at *p* conveys the blast, produced by a powerful blowing-engine, and heated to between 600° and 1,400° F. The B. F. may be used with the Siemens gas furnace.

IRON GLASS: BLOWING MACHINES.

The production of blast-furnace pig-iron in 1901 in the U. S. amounted to 15,878,354 long tons; an increase over that of the preceding year of 2,089,112 long tons. Pennsylvania ranked first with 7,343,257 long tons; Ohio, 3,326,425 long tons; Illinois, 1,596,850 long tons, and Alabama, 1,225,212 long tons.

BLASTING.

BLASTING: separating stones, etc., from their beds, or breaking them in pieces, by the use of explosives. Before gunpowder was invented, the separation of masses of stone from their native rock could be effected only by means of the hammer and wedge, or by the still slower method of fire and water. In soft and stratified rock, wedges are still used for quarrying stones for building purposes; but in hard rock, or where regularity of fracture is no object, gunpowder is ordinarily employed. There are two kinds of B.—first, the small-shot system; and second, that of large blasts or ‘mines.’

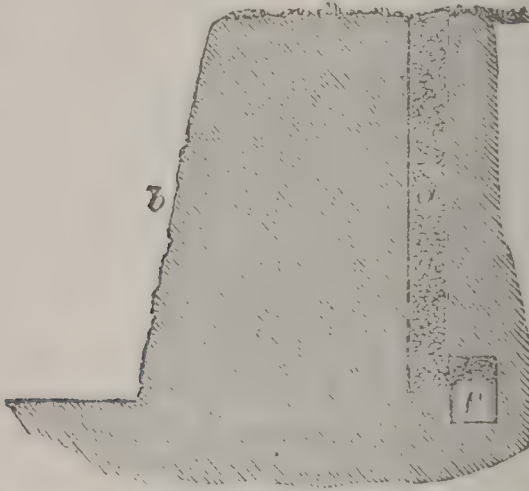
The small-shot system consists of boring holes into the rock, of from one to six inches in diameter, and of various depths, according to circumstances. In hard rock, this is done by a steel-pointed drill, struck by a hammer, and turned partly round after each blow, to make the hole cylindrical. The addition of a little water preserves the temper of the boring tool, and makes the rock more easy to cut. In soft rock, whenever the hole is to be vertical, a ‘jumper’ is used; this is a weighted drill, which acts merely by its own weight, when let fall from about a foot in height. The powdered stone is removed at intervals by a ‘scraper.’ The rate of progress varies, of course, with the hardness of the rock: the average work done by three men in hard quartz rock, with $1\frac{1}{2}$ inch drills, is 14 inches in depth per hour; one man holding the drill, and two striking. After the hole is bored, it is cleaned out, and the powder poured down. A wad of dry turf or hay is put over the charge, and the rest of the hole ‘tamped,’ or filled with broken stone, clay, or sand. The shot is fired by a length of Bickford’s patent fuse. When it is desirable to prevent the stones from flying about, when the shot is fired, a shield of boiler-plate, or of brushwood weighted, may be laid over the hole.

Small shots may be fired, even under water, by inclosing the charge in a tin case, with a tube of powder reaching to the surface; or in a canvas bag well tarred, tied at the neck round a length of Bickford’s fuse, which burns under water. The charge is inserted in the drill-hole; and the weight of the superincumbent water acts as tamping. Shots have been fired under water within a few yards of vessels, by using moderate charges, and by keeping a raft of timber floating over the hole, as a shield to prevent anything flying upwards. The voltaic battery has been used for firing shots, chiefly under water, since 1839. When a large mass of rock has to be removed at once, or where a steady supply has to be daily furnished of irregularly broken stone, for breakwater or other purposes, recourse must be had to large blasts, or ‘mines.’ One of the greatest isolated examples of this kind of blasting was the overthrow, in 1843, of the Rounddown cliff at Dover, by 18,500 lbs. of powder, in three separate charges, fired simultaneously by voltaic electricity. A specimen of mines on a grand system is seen in the quarries for supplying stone to the breakwater at Holyhead, where small shots having been found inadequate, large mines were intro-

BLASTING.

duced in 1850. These large blasts are of two kinds—'shafts' sunk from the top of the rock; and 'headings,' or galleries driven in from the face.

The shaft-holes are six ft. long by four ft. wide, of various depths, according to the height of the rock, but seldom much exceeding 60 ft. The deal box, with the charge of powder, *p*, is placed in a chamber, cut at one

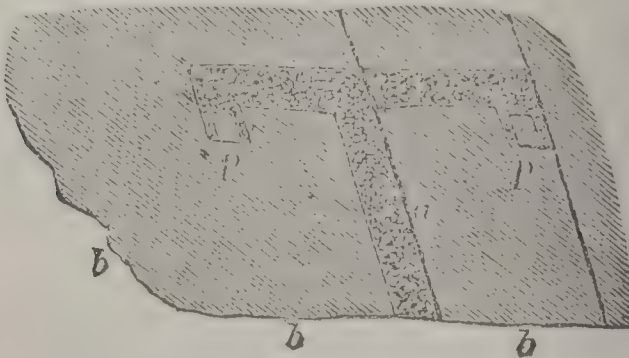


Vertical Section of Shaft:

a, tamping; *b*, face of the rock; *p*, box for charge.

side of the shaft, so that the tamping may not be in the direct upward line of fire. The tamping consists of the stone and débris which have come out of the shaft; and the wires from the battery are protected from injury by being laid in a groove cut in a batten placed up one angle of the shaft.

It is evident that the same point, *p*, in the rock may be reached as well by a heading or gallery driven in from the face of the rock, as by a shaft from the top, and often by a shorter route. Headings are made five ft. high by three



Sectional Plan of a Double Heading.

ft. six inches wide, and are driven, if possible, along a natural joint in the rock. The direction of the gallery is changed and sunk at parts, to prevent the tamping from being blown out. Four men can, on the average, drive five ft. run of heading per week: but cannot sink above

BLASTOCOLLA—BLASTODERM.

three or four ft. of shaft, which has a greater sectional area, and is more inconvenient to work in. Gigantic blasting operations have been carried on, and are still in progress, near New York in the channel of the East River. See **HELL-GATE**.

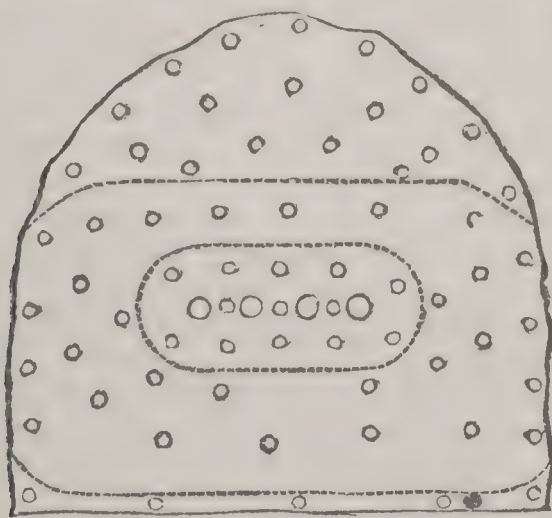
The charge of powder may be divided and placed in two or more separate chambers, as p and p' ; and it is better thus to spread a heavy charge over a length of face, than to have it in one spot, at a greater distance from the face than about thirty feet.

The charges for these mines vary from 600 lbs. to 13,000, and even more, pounds of powder; and the produce is from two to six tons of stone to the pound of powder, according to the density of the rock and the position of the mine.

Besides the quarrying of stone, B. is used for military objects, or where total destruction is aimed at, and an excess of powder is little or no objection.

Of late years great improvements have been effected in the production and application of explosive agents other than gunpowder, which latter, until lately, was used exclusively. Nitroglycerine (q.v.) and gun-cotton (q.v.) were discovered within two years of each other; but while gun-cotton was immediately applied to industrial purposes, nitroglycerine remained a chemical curiosity for about 16 years.

Dynamite is a preparation of nitroglycerine and porous earth, in the form of a pasty mass, which, without materially impairing its explosive properties, has the effect of rendering it safe to handle. For this and other explosives



Section of Mont Cenis Tunnel.

see **NITROGLYCERINE**. For an important class of blasting and boring operations see **TUNNEL**.

BLASTOCOLLA, n. *blās'tō kōl'la* [Gr. *blastos*, a bud; *kolla*, glue]: in *bot.*, a gummy substance coating buds.

BLASTODERM, n. *blās'tō dērm* [Gr. *blastos*, a bud; *derma*, a skin]: the outer surface of the embryo in its earliest condition; the germinal disc or primitive layer of

cells which forms on the egg in the early stage of incubation. BLAS'TODERMIC, a. -mĭk, pertaining to. See EMBRYO.

BLASTOIDEA, n. plu. blās-toy'dě-ă [Gr. *blastos*, a bud; *eidos*, resemblance]: an extinct order of Echinodermata. BLASTOSTYLE, n. blās'tō-stīl [Gr. *stulos*, a column]: certain columniform zooids in the *Hydrozoa* which are destined to bear generative buds.

BLATANT, a. blā'tānt [Dut. *blaet*, a boaster: mid. L. *blatĕān'tem*, speaking nonsense: L. *blatĕrārĕ*, to talk idly, to prate: probably only a formation of BLEAT: compare Gael. *bior*, a loud noise]: bellowing as a beast. BLATTER, v. blăt'tĕr, to make a senseless noise; to prate.

BLATCHFORD, blăch'ford, SAMUEL: jurist: 1820, Mar. 9—1893, July 7; b. New York; son of Richard Milford B. (1798–1875). He graduated at Columbia College 1837, and was private sec. to Gov. Seward 1839–43; was admitted to the bar 1842; and practiced at Auburn, N. Y., 1845–54, in partnership with William H. Seward and C. Morgan. He returned to New York 1854, having for partners C. A. Seward and B. W. Griswold; and there, besides the duties of a large practice, he prepared the reports of the U. S. circuit court for the second circuit, 1852, and with Mr. Howland those of admiralty cases in the U. S. dist. court for the s. dist., 1855. He was appointed to this bench 1867, May, and to that of the U. S. circuit court 1878, Mar. 4. His decisions have rarely been reversed. In admiralty and patent cases his opinions carried great weight, and the practice in extradition cases has been largely fixed by his decisions. He became an associate justice of the U. S. supreme court 1882, March.

BLAT'TA: see COCKROACH.

BLATTER, v. blăt'tĕr: to patter; to prate.

BLAVATSKY, bla-văts'kĕ, HELEN PETROVNA: theosophist: 1831–1891 May 8; b. Russia; widow of Gen. Nicephore V. Blavatsky, at one time gov. of Armenia. After 7 years in India, she came to the United States, and formed a theosophical soc. 1875 (Col. F. P. Olcott pres.), its professed object being to promote universal brotherhood, study Aryan literature and religion, and investigate the mysteries of nature and man. She returned to India, and, by her influence and that of Col. Olcott, numerous branches of the soc. have been established there. By some she was deemed to be a secret agent of the Russian govt.; not a few Englishmen, however, have favored her doctrines, which seem a vague mixture of mysticism and spiritualism. In 1885–6 the wonders that she claimed to perform, such as the transportation of letters by spiritual agency, were by investigators declared to be tricks; and the letters that she claimed to procure from Tibetan mahatmas, living and dead, were pronounced to be forgeries. B. edited *The Theosophist*, published in India; in 1877 she published a book, *Isis Unveiled: a Master-Key to the Mysteries of Ancient and Modern Science and Theology*. Her *Memoirs* were put forth by A. P. Sinnett, 1886. An article from

Mme. B. (*N. Amer. Rev.*, Aug., 1890) reports more than 200 branch societies, with 7 centres of publication—Madras (headquarters), Bombay, Ceylon, Stockholm, London, Paris, and New York; in Ceylon, 50 minor schools taken under supervision, and the government induced to recognize Buddha's birthday as a public holiday; in India, the pandit schools of Sanskrit literature and philosophy revived, and a library of 3,046 oriental works collected.

BLAYE, *blā* (ancient *Blavia*): fortified seaport, France, dept. of the Gironde, 20 m. n.n.w. of Bordeaux. It is on right bank of the river Gironde, at this point about 2½ m. in breadth, at the base of a rocky eminence crowned with a strong citadel. The town is further defended by the two forts of Paté and Médoc, which command the passage of the river. The port of B. is a very busy one, all inward vessels being required to anchor and deliver the manifests of their cargoes; and many outward-bound vessels lay in their provisions here. B. has manufactures of linen and woolen, glass and earthenware; considerable export trade in corn, wine, brandy, oil, fruits, soap, etc., and tribunals of jurisdiction and of commerce. Pop., exclusive of garrison, (1891) 4,340.

BLAZE, *n.* *blāz* [AS. *blase* or *blæse*, a torch or lamp; Icel. *blossi*, a flame; *blys*, a torch: comp. Gael. *bluthas*, warmth, heat]: the strong flame of any burning body; the full light of day: V. to flame; to shine with flame; to send forth light. BLA'ZING, imp. BLAZED, pp. *blāzd*.—SYN. of 'blaze, n.': fire· flame; conflagration; ignition; combustion.

BLAZE, *n.* *blāz* [Dut. *blesse*, a white streak on the forehead· Ger. *blässe*: Dan. *b'is*]: the white mark on the face of an animal; a white mark on a tree when a part of the bark is stripped off.

BLAZE, *v.* *blāz* [AS. *blæsan*; Dut. *blæsen*, to blow. Icel. *blása*, to blow, to blow a trumpet]: to blow abroad; to spread news; to publish. BLA'ZING, imp. BLAZED, pp. *blāzd*. BLA'ZINGLY, ad. -*lī*.

BLAZ'ING-STAR: familiar name in the United States for several very different plants; e.g. *Aletris farinosa*, called also colic-root; *Chamelirium Carolinianum* (starwort); and two species of *hiatris*, viz., *scariosa* and *squarrosa*. In heraldry, a comet used as a bearing, represented by a six-pointed star with a tail.

BLAZON, *v.* *blā'zn* [F. *blason*, a coat of arms: Sp. *blason*, honor, glory; *blasonar*, to boast, to blazon—from M.H.G. *blāsen*, to blow; *blāsa*, a trumpet: AS. *blæse*, a flame, splendor]: to portray armorial bearings in their proper colors; to deck; to embellish; to adorn: N. show; pompous display. BLA'ZONING, imp. BLAZONED, pp. *blā'znd*: ADJ. ornamented with a blazon. BLA'ZONMENT, *n.* BLA'ZONER, *n.* one who. BLAZONRY, *n.* *blā'zn-rī*, that branch of heraldry which describes or explains coats of arms in proper terms; the art of delineating the figures and devices of a coat of arms in their proper colors or metals.

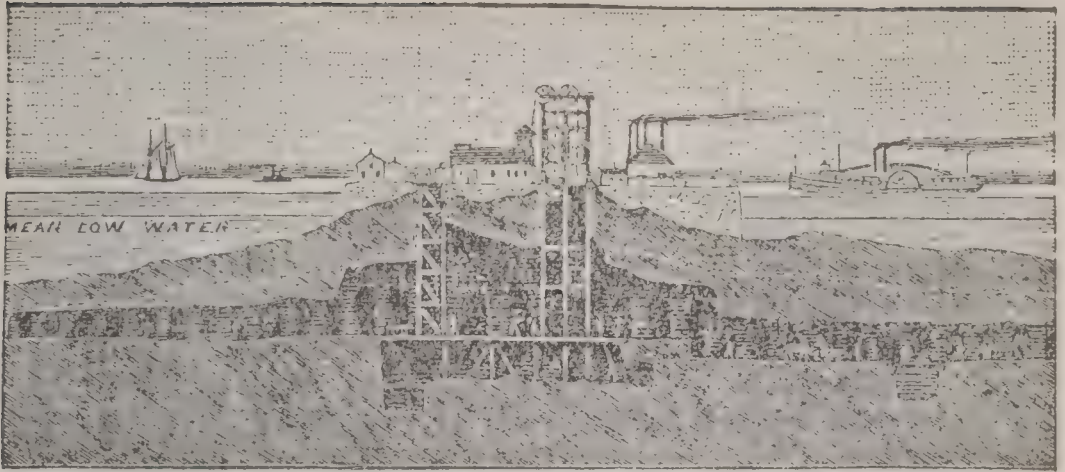
BLAZON, v. *blā'zn* [OE. *blasen*: a corruption of **BLAZE** 3, which see]: to make known far and wide; to make public by words or writing; to proclaim: N. in *OE.*, a proclamation; a trumpeting forth. **BLAZONER**, n. *-zn-ér*, one who blazes abroad: *Note*.—The two preceding entries are closely connected.

BLAZON—BLAZONRY: heraldic terms, originating in the custom of blowing a trumpet to announce the arrival of a knight, or his entrance into the lists at a joust or tournament. The blast was answered by the heralds, who described aloud and explained the arms borne by the knight. B. and B. thus came to signify the art of describing, in technical terms, the objects (or charges, as they are called) borne in arms—their positions, gestures, tinctures, etc., and the manner of arranging them on the shield.

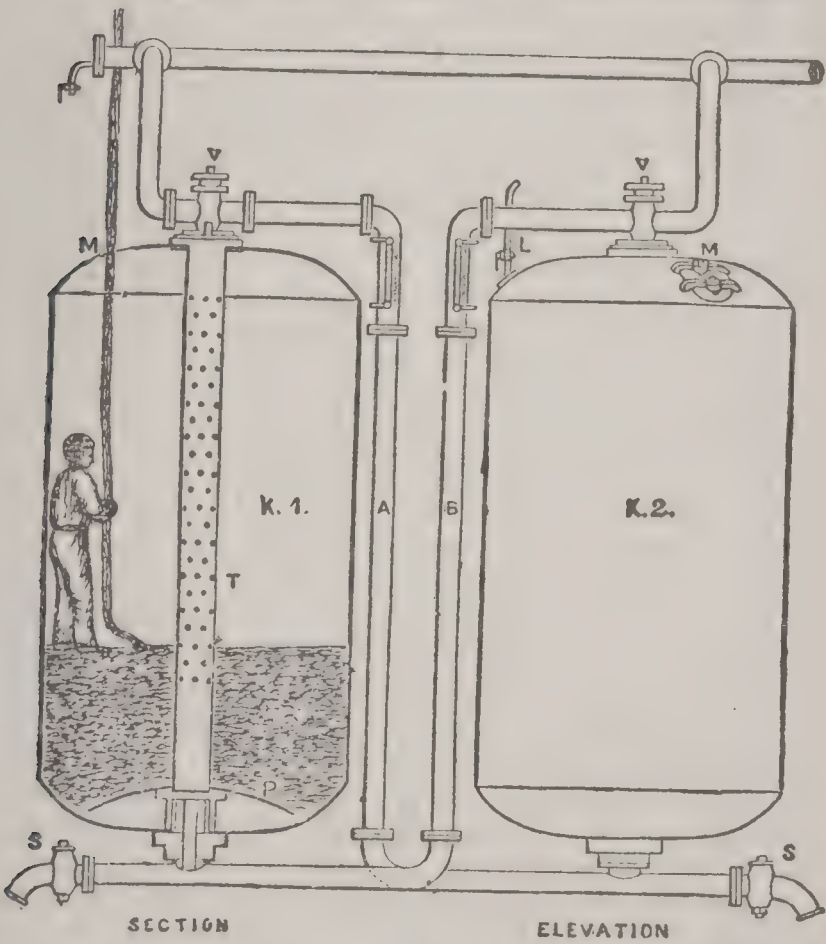
Rules of Blazoning.—As heraldry, though an entirely arbitrary, is a very accurate science, the rules of blazoning are observed on all occasions with the most rigid precision. The following are the most important: 1. In blazoning or describing a coat of arms, it is necessary to begin with the field, mentioning the lines by which it is divided—*per pale, per fess*, etc., if such there be—and noticing if they are *indented, engrailed*, or the like, it being taken for granted that they are straight, unless the contrary be mentioned. 2. There must be no unnecessary repetition in blazoning; thus, where the field is blue, and the charges yellow, the proper words are, *azure, a crescent between three stars, or*, thereby implying that both the crescent and the stars are *or*. 3. For the same reason, where a color has been already mentioned, and it is necessary, in order to avoid ambiguity, to repeat it in describing a subsequent charge, it must be said, *of the first, or of the second*, as the case may be; thus, *azure, on a saltire argent, three water bougets of the first*; avoiding the repetition of the word *azure*. 4. Again, recurring to the first example, it would be an error to say, *three stars with a crescent between them*, because B. must always begin with the charge which lies nearest the centre of the shield. 5. Where the charges are of the natural color of the objects or animals represented, in place of describing the color, it is simply said, *proper*—i.e., of the proper or natural color. 6. Another general rule in blazoning, or rather in marshalling coat-armor, is, that *metal shall never be placed upon metal, nor color upon color*, i.e., of the proper or natural color. 6. A general rule, in blazoning, or rather in marshalling coat-armor, is, that *metal shall never be placed upon metal, nor color upon color*.

For the rules for blazoning separate charges, whether animate or inanimate, see the titles of the respective charges: also **ORDINARIES**: **BAR**. **BEND**: **ETC.**

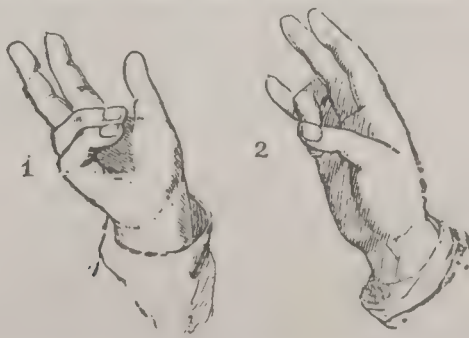
BLEACH, v. *blech* [AS. *blæcan*—from *blac*, pale: Dut. *blaken*; Icel. *bleikr*, light-colored; *bleikja*, to bleach (see **BLACK**)]: to make white by exposure to sun and air; to make white by chemical means; to take out color; to grow white in any way. **BLEACHING**, imp.: N. the art of making anything white, especially cloth. **BLEACHED**, pp. *blēcht*. **BLEACHER**, n. one who. **BLEACHERY**, n. *-ér-ī*, a place for bleaching. **BLEACHING-POWDER**, a salt of lime, being a mixture of the chloride and the hypochlorite. See **HYPOCHLOROUS ACID**.



Blasting.—Section Diagram of Hell Gate Tunnels.



Bleaching.—Pair of Barlow's Highpressure Bowking Kiers.



Position of Hand in **Blessing** : (1) in the Latin Church, (2) in the Greek Church,

BLEACHING.

BLEACHING: process of whitening or decolorizing any substance; generally understood of whitening or decolorizing cloth. Until about the close of the 18th c., B. depended upon the natural bleaching agencies present in the atmosphere and in the sun's rays. The usual plan was to spread out the cloth on a grass-field, called a bleaching-green, and to continue sprinkling it with water several times a day. After being thus exposed for several months to the action of air, light, and moisture, the cloth was rendered white. The process was necessarily tedious and occupied much valuable land, and for this reason much of the cloth required to be bleached was sent to Holland for that purpose. A particular kind of linen, regularly sent to Holland, received on that account the name of *Hollands*; and another variety of linen, which, from its fineness, was generally spread on the better grass-fields or lawns, received the title of *lawn*. An improvement in the preceding process was to dip the cloth occasionally in a weak *alkaline lye*, or solution of an alkali, such as soda in water, which step was called *bucking*; after which, the cloth was spread out on the grass for some weeks, and regularly moistened with water, this stage being styled *crofting*; the cloth was then soaked in sour milk and water, which was called *souring*, and again exposed on grass to the action of air and sunlight. By repeating the bucking, crofting, and souring operations several times, the bleaching was very much hastened, and the amount of land occupied in bleaching-greens lessened. The next improvement was the introduction of dilute sulphuric acid instead of sour milk, as the souring agent; and this was so effectual, that it lessened the time required for B. from about eight months, which was the original time, to about four months.

Formerly it was thought that the agent in this natural mode of B. was entirely resident in the sun's rays; but an active agency is now attributed also to the substance called Ozone (q. v.), now thought to be an allotropic form of oxygen, which possesses very powerful B. properties, and which in greatly varying proportions exists in the atmosphere.

In the year 1785, Berthollet, French chemist, discovered the powerful B. properties of *Chlorine* (q. v.), which destroys color by uniting with the oxygen of the coloring principle, so decomposing the color. At first, the gas chlorine was employed for bleaching cloth; then a solution of chlorine; but as these were found either difficult of proper application or liable to injure the fabric, chlorine gas was applied to dry, slaked lime, producing a *B. powder* commonly called *chloride of lime*, though its exact nature is not certainly known (see HYPOCHLOROUS ACID). It is not serviceable in the destruction of the color of wool, silk, or the oils and fats; such materials being bleached by the milder sulphurous acid.

BLEACHING OF COTTON AND LINEN FABRICS.—B. of linen is a much longer process than B. of cotton, as its fibre holds more impurities: linen in B. is said to lose one-third of its weight; cotton about one-twentieth.—The substances of which riddance is required in the purification of cotton

BLEACHING.

and linen cloth, are (1) the organic coloring matter naturally present in the fibre; (2) resinous and fatty bodies, also inherent in the fibre; (3) weavers' dressing and perspiration taken up during the process of spinning; and (4) certain saline or earthy substances. The B. process varies in details; but in its general principles it is as follows. For linen, the chemical solutions used are weaker. The *first stage* in the B. is the singeing of the cloth, drawing it rapidly over a red-hot iron cylinder, or a series of gas jets, which burn off the minute particles of fibre, leaving the cloth smooth. The *second stage* is the washing or scouring of the cloth in a large vat of lukewarm water, and then washing it, by a machine, in pure water. The *third stage* is boiling with lime-water, or *bucking* in a *Bucking Keir*, an apparatus consisting of two great cylinders connected by steam valves, by which the lime-water is forced alternately up and down through the cloth for about eight hours. Carbonate of soda is often mixed with the lime. The chemical action of the boiling lye on the cloth is in the formation of a soap with the resinous and fatty substances in the cotton or linen fibre. The cloth is afterward washed in pure water by a machine. The *fourth stage* in B. is the *souring* in dilute sulphuric acid, one gallon of the acid to 25 to 30 gallons of water: the cloth is first steeped in this liquid; then usually washed in water and bucked in soda-lye, and again washed. The *fifth stage* is *chemicking with B. liquor*, obtained by dissolving *B. powder* (q.v.) in water, in which the cloth is steeped about six hours; then soaked about six hours in a second vat of water, after which it is exposed to the atmosphere. The *sixth stage* is another *souring* process for about four hours in a steeping vat of dilute sulphuric acid, 1 to 8 gallons of acid in 200 gallons of water: the acid, combining with the lime of the B. liquid in the cloth, liberates the chlorine, which attacks the remaining traces of color and removes them. The cloth is then boiled with soda-lye, washed, and again treated with dilute sulphuric acid; is thereafter thoroughly washed, and passed through rollers to remove some of the water; then introduced into the *hydro-extractor* for full riddance of the water; and lastly dried by being suspended in the air, or by being passed over a series of heated tin rollers, called *steam cans*.

After the B. process, there is usually the *finishing* of the cloth, by use of a mangle or calender, giving a fine glazed surface; but cloth to be printed on, or to be dyed, is not starched or calendered.—The operations of B. by chlorine require for cotton 2 to 4 days; for linen scarcely less than 2 weeks. The chlorine process has a certain weakening effect on the cloth. Grass-B. is therefore still in use where time admits, as also for clearing linen and cotton apparel in domestic washing. See WASHING.

BLEACHING OF WOOL is not done by B. powder, which would destroy the fabric, but by sulphurous acid, which disguises the color of the wool by combining with it to form a colorless compound. Natural wool is coated with a complex fatty substance partially saponified, called the *yolk*. The *first stage* in the B. is for riddance of the yolk, usually

BLEACHING POWDER.

by steeping the wool in dilute alkaline carbonates, and stale urine (or for woolen cloth, carbonate of soda); followed by washing. The *second stage* is the *sulphuring*, effected by fumes of burning sulphur (sulphurous anhydride) in a close chamber; or by applying sulphurous acid in strong aqueous solutions: the sulphuring is the actual B. or whitening process. But wool to be dyed of dark color is not thus bleached, but only scoured. After about 24 hours of sulphuring the B. is finished, and the cloth is then thoroughly washed. The sulphurous acid does not *destroy* the color, but only masks it in a transiently colorless compound from which the color can be revived by soaking the wool in a dilute acid or in a dilute alkali. Hence, new woolen cloth, flannel, etc., almost colorless when purchased, after several washings return to their natural yellow; for the soda used, or the soap, resuscitates the original color.

BLEACHING OF SILK is similar to B. of wool. The silk has naturally nearly half its weight of a waxy substance with a little coloring matter, enveloping the fibre; and the silk stuffs are first put through an ungumming process by steeping in very dilute hydrochloric acid; then they are boiled with much care in a strong solution of olive-oil soap (if to be white) or of oleic acid soap (if to be dyed); the alkaline nature of the solution being occasionally tempered by admixture of bran, which contains an acid. For pure white, or for very light printing, the silk is finally exposed to the action of sulphurous acid gas.

Recently the B. of silk has been improved by the use of peroxide of hydrogen—suggested by William Crookes. After cleansing and the complete removal of the cleansing agents, the silks are simply laid in a B. bath made of peroxide of hydrogen, with which may be very minute quantities of ammonia or of soda-lye. Heat, not above 77° F., and sunlight hasten the B. process, which may occupy 2–14 days. This process may be used also in B. of furs, hair, feathers and leather: flax and jute can be bleached in one or two days. Also it is very successful in B. of wood for ornamental purposes. Since 1887 a B.-bath of peroxide of hydrogen has been prepared from the dry powder of peroxide of barium with an acid and certain salts.

For the B. action of charcoal on organic coloring matters in solution, see BONE-BLACK.

Other substances employed in the arts and manufactures are subjected to bleaching, as the rags in the manufacture of PAPER (q.v.), the palm oil to be converted into CANDLES (q.v.), and the STRAW (q.v.) for hats or bonnets: see details of these and other processes, under the respective titles.

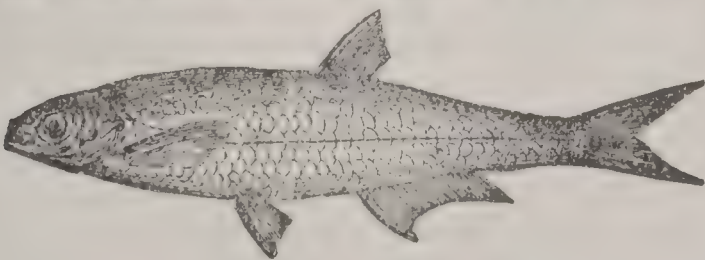
BLEACHING POWDER: a combination of chlorine and dry slaked lime (see BLEACHING); manufactured on a large scale first in Glasgow, Scotland, under patent obtained by Charles Tennant 1799. The substances employed in preparing the chlorine are common salt (chloride of sodium), black oxide of manganese, and sulphuric acid. The operation may be conducted in one or in two stages, the latter being most economical, as at each stage the residuum can be worked up into marketable products. The vessel used

BLEAK.

is a still, into which 100 parts of black oxide of manganese (MnO_2) and 150 parts of common salt (NaCl) are introduced by an opening in the top, which is closed by a water-joint; 185 parts of sulphuric acid (SO_3), of specific gravity 1600, are then poured in by a funnel, and on the admission of steam within the jacket (i.e., between the outer and inner walls of the still), chlorine is evolved and issues through a tube at the head of the still into a stone or leaden chamber, there coming into contact with dry slaked lime in fine powder, with which the floor of the chamber is covered to the depth of about six inches. The chlorine is rapidly absorbed by the lime, which, when the absorption flags, is stirred from time to time by wooden rakes. The process must not be allowed to proceed too quickly, as much heat is evolved during the combination of the chlorine with the lime; and if the temperature of the chamber rises beyond 110°F. , the power of combination is very much lessened. The chemical changes involved are not definitely known, but the resulting B. P. is a hypochlorite of calcium (CaCl_2O_2) with a variable proportion of chloride of calcium (CaCl_2), and uncombined lime. B. P. is a grayish-white powder, with a strong odor like that of chlorine. See SODA, MANUFACTURE OF: MANGANESE: also HYDROCHLORIC ACID: HYPOCHLOROUS ACID. The B. P., prepared in either one or two stages, contains, when freshly and fully manufactured, generally 33-49 per cent. of chlorine, and the strength of any sample is determined by the process of Chlorometry (q.v.). It is used as a disinfectant, and in making chloroform. Its manufacture is one of the leading chemical industries.

BLEAK, a. *blek* [AS. *blæc*, black: Ger. *bleich*; Dut. *bleek*, pale: Icel. *bleikr*, pale, wan]: cold; open; exposed; cheerless; solitary: N. a fresh-water fish, so named from its pale color, and whose scales are used in making artificial pearls. **BLEAKISH**, a. cheerless and open in a certain degree. **BLEAKY**, a. *blek'ī*, cold; chill. **BLEAK'LY**, ad. *-lī*. **BLEAK'NESS**, n. the quality of being bleak; exposure to cold and wind.

BLEAK (*Leuciscus Alburnus*): small fresh-water fish of the family of *Cyprinidæ* (q.v.), of a genus-name which, in N. Amer., we retain only in a tribe, *Leuciscinæ*. It is more than six or seven inches long; in general form it resembles the dace, but more elongated; the dorsal fin is fur-



Bleak (*Leuciscus Alburnus*.)

ther back, and the base of the anal fin is longer; the nose is pointed, the under jaw the longest; the scales are of moderate size, and beautifully striated; the back is of an olivaceous green color; the sides, belly, cheeks, and gill-covers, shining silvery white; all the fins nearly white. The tail is forked for half its length. The B. is found in many of

the rivers of Europe. On the inner surface of the scales of the B., as of white-bait, roach, dace, etc., a silvery substance, from which they derive their beautiful lustre, is found in such abundance as to be much used for making artificial pearls (q.v.), the white beads so common in ladies' head-dresses, and similar ornaments. That obtained from the scales of the B. is preferred to that of the roach and dace, but is inferior to that of the white-bait. It readily separates from the scales when they are soaked for a time in water, and settles to the bottom of the vessel. Small glass tubes are then dipped in it, and it is injected into thin hollow glass beads, of the requisite forms and sizes, which are placed in a current of air to dry, and are sometimes further filled with wax.—The B. is singularly liable to be infested by a species of tape-worm.

The B. is a very restless, active little fish, constantly playing about the top of the water, in search of small flies or other food. A small piece of bread cast into the water becomes speedily surrounded by a shoal of them darting to and fro at it. It is esteemed as delicate food, and is cooked in the same manner as sprats. The best way to catch B. is to angle for them with a single gentle and a light quill-float, the bait being about a foot under water; they may be caught with very small flies, and all the more easily, if the hook be pointed with a gentle. They are so active, that the angler cannot strike too quickly, and where they abound they form good preliminary practice for the young fly-fisher. The neighborhood of running drains is a favorite resort for B. and the angler can soon determine if there be any about, by casting on the water a handful of bran, when, if there be any, they will immediately rise at it.

BLEAR, a. *blēr* [Dan. *blære*, a blister: Low Ger. *blarren*, to cry or weep—hence, *blair-oge*, a red watery eye: prov. Sw. *blira*, to blink with the eyes: Sw. *plire*, to blink]: sore, watery, and tender in the eye: V. to make sore and tender; to blur; to dim. BLEAR'ING, imp. BLEARED, pp. *blērd*. BLEAR'EDNESS, n. state of one whose eyes are blear. BLEAR-EYED, having sore eyes; dim-sighted. BLEAR'NESS, n. soreness of the eyes. TO BLEAR ONE'S EYES, in *OE.*, to dim one's eyes; to deceive.

BLEAT, n. *blēt* [an imitative word: Dut. *blaten*; Ger. *blöken*, to bleat as a sheep]: the cry of a sheep: V. to cry as a sheep. BLEAT'ING, imp.: N. the cry of lambs or sheep. BLEAT'ED, pp. BLA'TANT, a. making a noise like a calf or sheep.

BLEB, n. *blēb* [an imitative word: Gael. *plub*, a round lump, a drop; allied to *bulb*—Lat. *bullā*, a bubble]: a drop of water; a blister; a vesicle; name applied to transparent bladders or blisters of the cuticle, appearing in some forms of fever, in erysipelas, and in disorders of the digestive apparatus. There are three varieties of B. recognized by physicians: 1. The mild B., which vary in size from a pea to a hazel-nut, occur on the face, neck or arms, and legs of teething infants, and of young persons who have indulged in unripe fruit. They generally burst, discharge the clear

BLEDSOE—BLEED.

fluid they contain, and heal up again in three or four days. 2. The tedious B., which most commonly affect aged and weakly persons, are seen as an eruption of numerous red elevations, which enlarge to the size of a pea, containing pale yellow serous fluid. These vesicles multiply to such an extent that the sufferer is disturbed at night from the irritation, and slight febrile attacks further debilitate him. 3. The solitary bleb generally selects old women for its victims, and appears, after much tingling of the skin, as one large vesication, and bursts in 48 hours, leaving a superficial sore.

The treatment consists in correcting the secretions, limiting the diet to what is farinaceous and easy of digestion, cooling drinks and tonics. For local treatment, the irritated surfaces are to be soothed by poultices and water-dressings.

BLEDSOE, *blěd'sō*, ALBERT TAYLOR, LL.D.: 1809, Nov. 9—1877, Dec. 8: b. Frankfort, Ky.; d. Alexandria, Va.: West Point graduate, 1830, then lieut. Seventh Infantry till 1832; assistant prof. of mathematics in Kenyon College, 1834; rector of Prot. Episc. Church, Hamilton, O., and prof. of mathematics in Miami Univ., 1835–36; practiced law in Springfield, Ill., and in the supreme court at Washington, 1840–48; became prof. of mathematics in the Univ. of Mississippi, 1848, then in the Univ. of Virginia, 1824. Afterward a colonel in the Confederate service, he was soon made asst. sec. of war. In 1867, he began to publish *The Southern Review*. In 1871 he became a Methodist, and preached occasionally. He has published several theological works and political essays, and a *Philosophy of Mathematics*.

BLEED, v. *blēd* [AS. *bledan* (see BLOOD)]: to lose blood by any means; to draw blood; to run sap from a tree. BLEED'ING, imp.: N. a flow of blood; operation of letting blood; hemorrhage: ADJ. flowing with blood or juice. BLED, pp. *blēd*. BLEED'ER, n. one who bleeds.

BLEEDING.

BLEEDING (*hemorrhage*): one of the most serious accidents which can happen to an animal, and giving rise to a grave complication in surgical operations. As there is but a limited quantity of blood in the body, and as the sudden escape of a large portion of it may cause death, every one should be instructed as to the measures most efficient for preventing a dangerous loss of blood. B. may be either from a wounded artery or vein, or from a raw surface; and it may be in the form of a general oozing from the surface of a sore or a mucous membrane.

Arterial B. is recognized by the florid redness of the blood, and by its issuing from the cut vessel *per saltum* or by jerks. There are exceptions to this, however. When an artery has been tied, and bleeding occurs from below the ligature, the flow of blood is continuous, and of a dark color.

If a large artery be wounded, the first gush of blood may prove fatal, but in general the patient faints, and nature takes advantage of the respite to place the cut artery in circumstances as favorable as possible to the preservation of life; viz., the artery draws up within its sheath (see **ARTERY**); the blood, no longer impelled vigorously by the heart, clots between the cut end and the cellular tissue surrounding it; the inner and middle coats not only *retract* but *contract*, and another clot forms within the arterial tube. These clots—which, with the faintness and the contraction and retraction of the artery, are termed natural *hemostatics* (blood-stoppers)—are sufficient in many cases to prevent a recurrence of the B.; but such a happy concurrence is not to be depended on, and there should be preparation to adopt some of the many surgical or artificial means for restraining the flow of blood till adhesion (q.v.) can occur between the cut surfaces of the coats of the artery. The principal surgical means are:

Immediate pressure, which may be applied by pressing the finger-tip on the place whence the blood is seen to flow, and may be kept up by pads of lint, or a coin of convenient size wrapped in cloth, and secured with a bandage to the part.

Pressure on the artery above, or as it comes to the cut part. This requires some knowledge of anatomy, but not more than any intelligent person may easily acquire. Thus, pressure on the inside of the arm, about midway between its front and back, will press the brachial artery (q.v.) against the bone, and arrest any bleeding from wounds of the forearm and hand. Pressure on the middle of the groin with a thumb placed crosswise will control the stream of blood in the femoral artery, so that none can escape from any wound below where the pressure is made.

Pressure on the course of the vessel may be very efficiently effected by tying a handkerchief round the limb above where it is injured, and then inserting a stick, and twisting it sufficiently tight. This is the principle of the original tourniquet, which was invented by Morel, a French surgeon, at the siege of Besançon, 1674. He got the idea from seeing how carriers tightened the ropes which se-

BLEEDING.

cured bales of goods on their carts. It has been modified from time to time. At present it consists of a strap and buckle, a pad which may be adjusted over the course of the artery wounded, or likely to be cut in an operation, and a screw by which the strap may be tightened as the surgeon may deem necessary. See *TOURNIQUET*. The objections to *pressure* as a means of arresting hemorrhage are, that it is very painful, that it includes the vein, and thereby engorges the limb with blood, and may cause mortification, if long continued.

'*Actual*' *cautery*, or hot iron, is occasionally useful in bleeding from a bone, or at some points where pressure cannot be efficiently applied. It is the oldest method of stopping bleeding, and until the 18th c. was much in use; but its abuse, and the natural horror felt for it by both patient and surgeon, have almost banished it from the list of surgical hemastatics. If used, the iron should be at white heat, the wound pressed for an instant, and then the iron should be held in contact with the bleeding vessel. It causes an eschar or slough, with shrivelling of the artery; and if the latter be small, it effectually stops the bleeding, until the eschar drops off, when the vessel may be found still pervious at the wounded part, and the danger of bleeding be as great as at first.

Ligature, or tying the artery, is a very old method of arresting hemorrhage, and certainly the best. It was not used generally, however, in operations until improved anatomical knowledge and more efficient tourniquets allowed surgeons the time necessary for its application. See *LIGATURE*.

Another method was introduced by Sir James Y. Simpson of Edinburgh, and was termed by him *Acupressure* (q.v.), or pressure from a long needle or pin inserted from without, so as to press the artery between it and the tissues. The pins are removed after 24-48 hours. This plan (superseded by the catgut ligature, which can be absorbed) promised to supersede the older kinds of ligature, especially in amputations, where the vessels can be easily secured, and where occasionally they are found so brittle from disease (see *ATHEROMA*) as to break under the pressure of a thread. It is not now in common use by surgeons, having been superseded by hæmostatic forceps.

Venous B. is recognized by the dark color of the blood, and its continuous flow. Pressure is generally sufficient to arrest it, and it should be applied directly over the wounded part. If pressure be insufficient to stop the flow, the cut end should be seized with a pair of hæmostatic forceps and tied with cat-gut, using every antiseptic precaution to prevent the entrance of, or to destroy, germs that may be present. The fear of tying a vein, prior to the era of antiseptic or aseptic surgery, was perhaps well founded; but veins can now be tied in entire safety, though the surgeon must be perfectly sure of his antiseptic precautions, and if they be not cut quite through, he may pick up the cut edges in a forceps, and tie them so as still to permit a flow of blood through the vein.

BLEEDING.

Oozing from cut surfaces of course partakes of the characters of venous and arterial B., but there is no vessel sufficiently large to demand a ligature pressure. The actual cautery and cold may then be used, or one of the many styptics, the strong perchloride of iron may be specially recommended; it may be applied on lint or a sponge; or astringents, such as alum and tannin; there are also the puff-ball, mushroom, agaric, and matico leaves, cobwebs, felt, etc., which act mechanically, and owe their reputation chiefly to the pressure used in their application. Some persons have a congenital tendency to bleed (the hemorrhagic diathesis); if such a one have a trifling cut, or have a tooth pulled, he bleeds perhaps to death. A prudent surgeon will not perform cutting operations on one of a hemorrhagic family.

B. from the free surfaces of mucous membranes occurs when they are much congested. One may have fatal hemorrhage from the stomach, and yet no open vessel may be found after death, even on the most careful examination. In such a case, resort must be had to cold and internal remedies, such as tannic acid combined with opium.

BLEEDING or BLOODLETTING.—Blood may be drawn from a vein (phlebotomy—venæsectio), or from an artery (arteriotomy).

The veins usually opened for this purpose are those at the bend of the elbow (see ARM), but those of the lower limbs are occasionally selected. The patient should be placed sitting up in bed, as he may lose a dangerous amount of blood without showing the usual premonitory symptoms, if his head be kept low.

The venous return should now be obstructed by a bandage, and when the veins swell, one should be selected, steadied with the left thumb, and slit obliquely with a lancet; the blood allowed to flow till the desired quantity has escaped, or till faintness comes on. The surgeon's thumb should now be replaced on the cut in the vein, and kept there till the bandage is removed, when a small pad of lint and figure-of-eight bandage will sufficiently prevent the bleeding, and the wound will speedily heal.

Phlebotomy was at one period habitually resorted to in inflammatory diseases, or such as were thought so; and even when there was no positive disease, it was often applied periodically at particular seasons, as spring and autumn, as a hygienic precaution. A great change in this respect has taken place in medical practice; as physiological knowledge advances, the opinion seems gaining ground that abstracting blood from a sick man gives him but temporary relief, and renders him less able to combat with the disease. When there is a wound of the cavities of the body with internal hemorrhage, venesection is very useful in lowering the heart's action, and perhaps, according to the old theory, in exercising a *derivative* influence on the wounded vessels. Local B. is effected by cupping and leeches. See articles on these; and VENESECTIO.

BLEEK—BLEMYES.

Arteriotomy is performed usually on the temporal artery, by a transverse cut about half-way through the vessel. When the required amount of blood has been abstracted, it ought to be completely cut across, to allow of its ends retracting and healing. If this precaution is neglected, an Aneurism (q. v.) would form. A compress and bandage should be put on the head for a day or two.

BLEEK, *bläk*, FRIEDRICH: 1793, July 4—1859, Feb. 27; b. Abrensbök, in Holstein: distinguished German biblical critic and exegete; educated at the gymnasium at Lübeck, the University of Kiel, and in Berlin under De Wette, Neander, and Schleiermacher; in 1818, tutor in theology at Berlin, soon publishing noteworthy essays on the *Sibylline Oracles* and on the *Book of Daniel*; after three years lost his position on account of unfounded suspicions; in 1823, extraordinary prof. at Berlin; in 1829, prof. of theology at Bonn, where for 30 years he attracted students to his lectures, by his thorough investigation, impartial judgment, and clear presentation; in 1843, consistorial councilor and rector of the university. He died suddenly of apoplexy. Of the 'advanced' school in his Old Testament criticism, he was yet conservative with respect to the New Testament. His defense of the genuineness of the Gospel by John is of much value. His greatest work, *Commentary on the Epistle to the Hebrews*, is commended by De Wette and Delitzsch as one of the best.

BLEIBERG, *blī'bērg*: town of Austria, province of Carinthia, in the circle of, and about 8 m. w. of Villach; pleasantly situated in the valley of the Drau, or Drave, near the celebrated Bleiberg (Lead Mountain). The people are engaged chiefly in the mines of the Bleiberg—from which 1,500-1,800 tons of lead are annually obtained—and in washing and smelting the ore. Pop. (1890) 4,601.

BLEMISH, n. *blēm'ish* [OF. *blesmir*, to soil or spot, to make livid with blows—from *blesme*, pale, wan: Icel. *blami*, the livid color of a bruise]: a soil or spot; any defect; any mark or scar that lessens the beauty and proportion; deformity; imperfection in character: V. to impair or injure; to tarnish. BLEM'ISHING, imp. BLEM'ISHED, pp. *-isht*. BLEM'ISHABLE, a. *-ā-bl*. BLEM'ISHLESS, a. without blemish. BLEM'ISHER, n. one who.—SYN. of 'blemish, n.': defect; flaw; fault; spot; speck; deformity; stain; taint; reproach; disgrace; imputation; dishonor.

BLEMYES, or BLEMMYES, *blēm'mī-ēz*: a race represented by some ancient writers as fabulous, but known to have lived in Africa in historic times, and supposed to be ancestors of the modern Bishareen, Ababdeh, and other tribes. They were nomadic, ranging over an unknown extent of territory, and occupying different regions at different periods. In Ptolemy's time they lived between what are the modern Bahr-el-Azrek and Atbara—earlier referred to as extending beyond the Lybian desert. In the 2d c. they made inroads into the Roman province of Egypt. Later under powerful chiefs they obtained, by permission of Diocletian, possession of the Nubian territory, till then held

BLENCH—BLENHEIM.

by Rome. Even till the 7th c. they are known to have been making their hostile excursions.

BLENCH, v. *blēnsh* [AS. *blencan*, to deceive: Icel. *blenkja*, to impose upon: same as **BLINK**, and probably **FLINCH**]: to shrink; to start back; to flinch; to give way: N. in *OE.*, a start.

BLEND, v. *blēnd* [AS. *blendan*, to mix, to confuse: Dut. *blanssen*, to dabble in water: Icel. *blanda*, to mix: Dan. *blande*, to mix one's self with]: to mingle together so as not to be able to separate; to confound. **BLEND'ING**, imp.: N. in *painting*; so laying on different tints as to render it impossible to tell where one color begins and another ends. **BLEND'ED**, pp. **BLEND'ER**, n. one who.

BLENDE, n. *blēnd* [Ger. *blenden*, to dazzle]: a term applied to several minerals having a peculiar lustre or glimmer, variously colored, as hornblende, zincblende, etc., now generally restricted to the sulphide of zinc; the black-jack or mock ore of English miners. **BLEND'OUS**, a. *blēn'-dūs*, relating to blende.

BLENDE: name given to a number of minerals composed chiefly of sulphur and of certain metals, all or almost all of splendid lustre, at least in fractures and on the faces of crystals. It is also often popularly applied exclusively to one of these minerals, to which alone, perhaps, it originally belonged. **ZINC B.**, or **GARNET B.**; called also, according to its chemical composition, *Sulphuret of Zinc*. Among English miners it is known as *Black Jack*. It is abundant both in primitive and in secondary rocks in many parts of the world, and is often associated with Galena (q.v.) or Lead-glance. It contains about 66 parts of zinc and 33 of sulphur, and is used as an ore of zinc (q.v.); but the reduction of it is attended with difficulty, which much diminishes its value. It is usually brown or black, sometimes red, yellow, or green. It occurs both massive and crystallized in rhomboidal dodecahedrons, octahedrons, and tetrahedrons. Macles, or twin crystals, are remarkably common. It is very brittle; before the blow-pipe, it decrepitates violently, but fuses only on thin edges.—**MANGANESE B.** is a rare mineral, composed of sulphur and manganese.—**ANTIMONY B.**, or *Red Antimony*, also is a rare mineral, composed of sulphur and antimony.—**RUBY B.** is a name sometimes limited to Pyrargyrite, or Red Silver (see **SILVER**, **ORES OF**): sometimes extended as a sort of generic term to include a number of other minerals composed of sulphur and metals, among which are Cinnabar (q.v.), Realgar (q.v.), and Orpiment (q.v.).

BLÉNEAU, *blā-nō'*: village of France, dept. of the Yonne, about 29 m. w.s.w. of Auxerre, celebrated as the place where Turenne gained a victory over the Prince de Condé, 1652. Pop. (1891) 2,084.

BLENHEIM, *blēn'im* (Ger. *Blindheim*): village of Bavaria, 23 m. n.n.w. of Augsburg, memorable in connection with Marlborough's great victory over the French and Bavarians, 1704, Aug. 13. The battle, however, did not actually take place here, but at a village in the vicinity

BLENHEIM DOG—BLENNERHASSETT.

called Höchstädt, and is known to the Germans by that name. France and Bavaria, on the one hand, stood opposed to Holland, England, Austria, Savoy, Portugal, and the German empire on the other. The French and Bavarian army consisted of 56,000 men, commanded by Tallard, Marsin, and the Elector of Bavaria. Opposed to it was an army of 52,000 men, under the command of Marlborough and Prince Eugene. The French and Bavarian generals had no idea that the allies would act on the offensive, and accordingly, when, about two o'clock in the morning, Aug. 13, the line of the allies put itself in motion, they believed that it was about to retreat. Even at seven o'clock, when the heads of the eight columns advancing under Eugene and Marlborough became visible, Tallard regarded the whole proceeding as a stratagem to cover the retreat. When the mistake was discovered, the army was hastily drawn up in battle-array, and fought with dauntless courage; but at five in the afternoon Marlborough broke through the line of battle, and won a most decisive victory. The French and Bavarians left about 10,000 killed and wounded on the field, vast numbers were drowned in the Danube, and about 13,000, including Tallard, were taken prisoners. Altogether their loss was estimated at between 30,000 and 40,000; 120 pieces of cannon and 300 standards were captured. The loss of the victors amounted to about 5,000 killed and 8,000 wounded. Near to B., also, the French defeated the Austrians in 1800.

BLENHEIM DOG, or MARLBOROUGH DOG: small and very beautiful variety of spaniel, much resembling the King Charles spaniel (q.v.) in form and general appearance, but differing in the color, which is white, with orange or flame-colored markings. In weight it should not exceed five pounds. The B. spaniel is the *Pyrame* of Buffon. It derives its English name from Blenheim Palace in Oxfordshire, the seat of the Dukes of Marlborough, where the breed has been preserved since the beginning of the 18th c. These dogs are sometimes sold at an enormous price.

BLENHEIM HOUSE, near Oxford: seat of the Duke of Marlborough, erected at the public expense in the reign of Queen Anne as a testimony to the victor of Blenheim (q.v.). £500,000 was voted for the purpose, but that sum did not suffice for the completion of the work. The royal estate of Woodstock, in which it stands, was granted at the same time. The building was designed by Sir John Vanbrugh, and is a grand, though heavy monument of his powers as an architect. The length of the principal front from wing to wing is 348 ft. The interior is proportionally magnificent, the collection of paintings was one of the most valuable in Britain. Among the objects of interest in the grounds are a triumphal arch, and a column 130 ft. high, surmounted by a statue of Marlborough. An inscription on the pedestal, by Bolingbroke, recites the public services of the hero. The manor of Blenheim Park embraces a circuit of about 12 m. The paintings, gems, books, etc., were sold 1875-86.

BLENNERHASSETT, HARMAN: 1764-1831; b. Eng-

BLENNORRHEA—BLENNY.

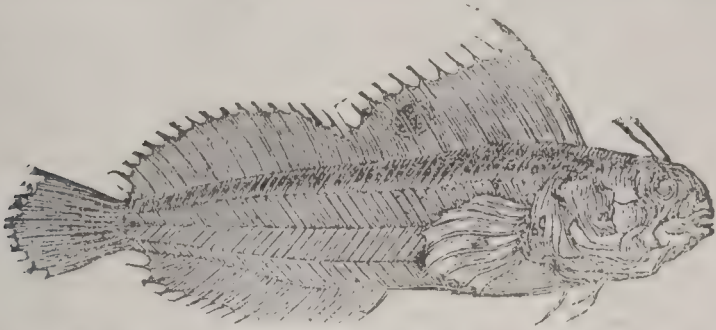
land; educated for the law in Ireland; sold his estates in Ireland for more than \$100,000, came to the United States, built a fine residence on an island in the Ohio, below Parkersburg, Va., there dispensing elegant hospitality; became interested in Aaron Burr's scheme for seizing Mexico, where Burr was to be emperor, B. a duke and ambassador to England; and spent large sums in fitting out an expedition. He was afterward arrested, but Burr's acquittal set him and all the suspects free. He returned bankrupt to Natchez and became a cotton planter; but commerce being destroyed by the war with England, he went to Montreal to practice law. To secure certain property he went in 1822 to Ireland, but failed in this and every other project. A sister supported him in his last years, and left a small estate to his wife and children. B.'s wife, daughter of Gov. Agnew, of the Isle of Man, was a woman of culture, author of *The Deserted Isle*, *The Widow and the Rock*, and other poems. After her husband's death, coming to the United States, she petitioned congress to repair her losses, but died before final action was taken. A son, Joseph Lewis, some time practiced law in Missouri. In 1864 were published *Blennerhassett Papers*, with a memoir.

BLENNORRHEA, n. *blĕn'ŏr-rĕ'ă* [Gr. *blennos*, mucus; *rheō*, I flow]: excessive flow or secretion from mucous glands in any situation; as the term does not well express the nature of such fluids, modern writers do not often make use of it. *Mucus* is a pellucid, ropy substance, which, according to Sir James Paget, 'has no corpuscles or organized particles of its own. In those discharges termed blennorrhœal, on the other hand, there is a mixture of epithelial scales shed in large quantities from the mucous membrane (mucus cells), and occasionally pus cells. In B. of the lachrymal sac, or what is called 'watery eye,' if the inner corner of the eye be pressed by the fingers, an opaque, milky fluid will appear between the lids, instead of the transparent tears which are present when the lachrymal apparatus is in health. After inflammations of the genito-urinary mucous membrane, a gleet discharge frequently occurs, and continues for a long period. The treatment consists in establishing a robust state of health by tonics and the preparations of iron, fresh air, and careful regimen, with astringent lotions applied directly to the mucous membrane, such as alum, tannin, etc., to lessen the quantity of the secretion, and occasional caustic stimulants, as the nitrate of silver, to alter the depraved condition of the secreting membrane.

BLENNY, n. *blĕn'nĭ* [Gr. *blenna*, mucus, slime], (*Blennius*), genus of a group of not valuable fish, which has 2 small e. U. S. species and many on the Pacific coast: near the *Gobiidae*, and by many naturalists included in it. To the B. family, the Wolf-fish (q.v.) and the Gunnel (q.v.) or Butterfish are referred. The fishes of this family are generally remarkable for the abundance of slimy matter with which their skin is covered; whence their name. Many are destitute of scales. The body is generally of an elong-

BLÉRÉ—BLESS.

gated form. They have only one dorsal fin, which, however, seems in many of them as if composed of two parts. They are distributed in the seas of all parts of the world.—The true blennies are small fishes, living in shoals, which do not consist of great numbers, frequenting rocky coasts, and often found in pools left dry by the tide, or even among the wet sea-weeds, among which they are capable of subsisting for a much longer time than that of the absence of the tide. They possess the power of using their ventral fins to aid them in moving about among rocks and sea-weeds.



Ocellated Blenny or Butterfly Fish (*Blennius ocellaris*).

They have a fringed appendage over each eye. They are seldom thought of as an article of food, but are in demand for the aquarium, on account of their tenacity of life and their activity. They feed chiefly on small crustaceans.—Many of the B. family retain their eggs within the oviduct until they are hatched, so that the young are produced alive, and capable of seeking food for themselves. An example of this is found in the Viviparous B. (*Zoarces vivipara*) of the British coasts.

BLÉRÉ, *blā-rā'*: town in the dept. of the Indre-et-Loire, France; on the left bank of the Cher, here crossed by a bridge; said to owe its origin to Henry II. of England. It is about 15 m. e.s.e. of Tours. B. is the entrepôt for most of the traffic on the Cher. In its vicinity is the castle of Chenonceaux, the residence purchased by Henry II. of France for the celebrated Diana of Poitiers, who lavished much money on its embellishment, as did also Catharine de' Medici, after she had dispossessed Diana. In 1733, it became the property of M. Dupin, whose wife, by her beauty and wit, attracted to the castle almost all the distinguished literary and scientific men of that day, including Montesquieu, Voltaire, Fontenelle, Buffon, Bolingbroke, and Rousseau. The castle escaped the fury of the revolution, and is still in good preservation. Among the curiosities shown to the visitor is the mirror used by Mary Stuart (Queen of Scots) on her marriage with the Dauphin. Pop. (1891) 3,272.

BLESS, v. *blēs* [AS. *bletsian* or *blessian*, to consecrate, to bless—from *blōt*, a sacrifice; *bloten*, to sacrifice]: to make holy by a prophetic benediction; to set apart by consecration; to pronounce a solemn benediction; to prosper; to praise; to give thanks to; to glorify or praise for benefits received; to utter a wish of happiness to one. BLES'SING, *īncp.*: N. a wish of happiness to another; gift; benefit or

BLESSED THISTLE—BLETTING.

advantage; divine favor. BLESSED or BLEST, pp. *blĕst*: ADJ. made happy; enjoying felicity. BLESSED, a. *blĕs'sĕd*, happy and prosperous; enjoying spiritual happiness. BLESSEDLY, ad. *-lĕ*. BLESSEDNESS, n. happiness; the favor of God; felicity. BLES'SER, n. one who. SINGLE BLESSEDNESS, the state of an unmarried person; a felicity enjoyed alone. *Note*.—BLESS and BLISS are not connected etymologically, though made apparently to become so by the modern mixing up of their meanings.—SYN. of 'blessedness': felicity; joy; happiness; bliss; beatitude; blessing.

BLESS'ED THIS'TLE: see THISTLE.

BLESSINGTON, MARGARET, Countess of: 1789, Sep. 1—1849, June 4; b. Knockbritt, near Clonmel, Tipperary county, Ireland, where her father, Edward Power, was settled. At the early age of 15 she was married to Captain Farmer, and, shortly after his death, to Charles John Gardiner, Earl of Blessington. With him she took several extensive journeys on the continent, where, as well as in London, she gathered around her all the most distinguished men of the time. In Genoa, she formed an intellectual friendship with Lord Byron, and afterward resided in Paris, until the death of her husband, 1829. The latter left her a large estate, which enabled her to gratify her literary tastes. She held a little court of her own, at her family mansion, Gore House, Kensington, a suburb of the west end of London. Her celebrated soirées were frequented by many of her distinguished contemporaries. Her subsequent connection with Count d'Orsay placed her in an equivocal position as regards society, and consequently, on the accession to power of Louis Napoleon, with whom both were intimate, they left England for France; and at Paris she died. She was the authoress of two works of little importance, *Idler in France*, and *Idler in Italy*. Her only valuable production is her *Conversations with Lord Byron* (1834), which helped to place the poet in a more favorable light before his countrymen.

BLETCHINGLEY: town, chiefly agricultural, in the s.e. of Surrey, 20 m. s. of London. Many Roman coins have been found in the vicinity. Near B., 2,000–3,000 tons of fuller's-earth are raised annually. In cutting the B. railway tunnel, the fossil bones of the iguanodon, an extinct reptile, were found. Pop. abt. 2,000.

BLETS: rotten spots in apples, pears, and other fruits. The rotting of such fruits is often called *bletting*. It takes place chiefly by the decomposition of the proteine (q.v.) compounds which the fruits contain, and the fermentation of the sugar; carbonic acid is formed; and the fibres of a fungus can be discovered by the microscope pervading the bletted part, to the rapid extension of which they no doubt greatly contribute, although it by no means follows that the presence of the spores or seeds of the fungus should be regarded as the original cause of the decay.

BLETTING, n. *blĕt'ting* [F. *blĕtte*, over-ripe: L. *blītĕŭs*, tasteless—from L. *blitum*; Ger. *bliton*, a tasteless vegetable, but used as a salad]: the change that occurs in the pulp of

a fruit after being kept for some time, and by which a sour, hard fruit becomes soft, edible, and pleasant.

BLEW, v. *bló*: see BLOW.

BLICHER, *blik'ér*, STEEN STEENSEN: 1782-1848; b. at a village of Viborg; son of a pastor in Jutland: distinguished modern Danish poet and novelist; took his theological degree at Copenhagen, 1809. He was long known only as the successful translator of Ossian, 2 vols. (1807-09). His *Sneeklokken* (1826), and still more his contributions to the monthly periodical *Nordlyset*, brought him into fuller notice; and in 1829, his *Jydske Romanzer* had great success, and his *National Noveller*, giving a poetical and faithful picture of country life in Jutland, were even better received. As a poet, B. is thoughtful, tender, and eminently national, but lacks objectivity. His novels appeared in 5 vols. (Copen. 1833-36), his poems in 2 vols. (1835-6), and these were followed by *Samlede Noveller og Dichte* (1840), and *Gamle og nye Noveller* (1847-8), etc. Specimens of B. are given in *The Danes sketched by Themselves*, by Mrs. Bushby (1864).

BLIDAS, *blé'dá*: town of Algeria, province of Algiers, abt. 30 m. s.w. of the city of Algiers; beautifully situated on the borders of the fine plain of Metidjah, surrounded by gardens; a prosperous place. It was occupied by the French, 1838. It is a station on the first line of railway in Algeria. The foundation-stone of the railway station was laid, 1859, in the presence of a large number of Arabs, who regarded the ceremony with intense interest. Pop. (1891) 23,686.

BLIGH, *bli*, WILLIAM: 1753-1817: English admiral; celebrated in connection with the mutiny of the *Bounty*. Having made a voyage round the world under Captain Cook, he was sent out, 1787, Dec. 23, by the British govt., as commander of the ship *Bounty*, to Tahiti, there to collect breadfruit-tree plants, and thence sail with them to the West India colonies, where it was desired to introduce them. The ship arrived at her destination in Oct. of the following year, and in six months later was ready to sail for Jamaica, with 1,015 plants on board. Partly on account of their demoralization by their long stay on so charming and productive an island, and partly owing to the harsh and tyrannical treatment they met with from their commander, a part of the crew mutinied, after they had been 24 days out, Apr. 28, and forced the captain and eighteen men into the ship's launch, which they cast adrift, turning their own course back to Tahiti, and ultimately settling on Pitcairn's Island (q.v.) The captain and his companions, who had very little provision, and no sextant or map, arrived, after almost incredible hardship, at the island of Timor. June 14, 3,600 nautical miles from the point where they were abandoned. To the skill and prudence of B., the fact that not a single life was lost is chiefly attributed. On B.'s arrival in England, a man-of-war, under Captain Edwards, was sent, at his instance, to capture the mutineers. Some of them were seized; the rest had escaped to Pitcairn's Island, with Fletcher Christian, the leader of the mutiny. Their place of refuge, however, was

BLIGHIA—BLIGHT.

not discovered until 1808, when an American ship accidentally touched at the island. At that time, drunkenness, debauchery, and unbridled passion had left only one of the mutineers, John Adams, remaining. Their fortunes here were made the subject of a poem by Byron, entitled *The Island; or Christian and his Comrades*. B. was again sent out to collect breadfruit-trees, and convey them to the West Indies, in which he was completely successful. In the French revolutionary war, B. commanded a ship of the line, but again exciting the disaffection of his men by his harshness, they mutinied, and ran the ship into a French harbor. In 1806, B. was appointed gov. of New South Wales, but his conduct here was so tyrannical as to cause universal dissatisfaction; and in 1808, the civil and military officers of the colony summarily terminated his government by arresting him.

BLIGH'IA: see AKEE.

BLIGH ISLANDS: that portion of the Feejee archipelago originally discovered by Tasman, 1643, which was seen by Captain Bligh of the *Bounty*, during his wonderful voyage in an open boat; in nearly 180° of long. and 15° 30'–19° 30' s. lat.

BLIGHT, n. *blit* [AS. *blæc*, pale; *blican*, to shine: Low Ger. *blekken*, to shine: Icel. *blikja*, to gleam: O. H. G. *blich-flur*, blight-fire or lightning—from the idea of being blasted with lightning]: a disease common to plants, by which they are withered either wholly or partially, usually caused by minute fungi; anything nipping or blasting: V. to retard growth or prevent fertility; to blast; to frustrate. BLIGHT'ING, imp. BLIGHT'ED, pp.: ADJ. smitten with nipping or blasting; withered in one's hopes. BLIGHT'INGLY, ad. -lī.

BLIGHT: a diseased state of the cultivated grasses, especially of the cerealia. The term is vaguely and variously used, having been applied to almost every disease of plants caused by the condition of the atmosphere, or of the soil, the attacks of insects, parasitic fungi, etc. It is frequently limited to the disease in wheat and other grains, which is called also SMUT-BALLS, BUNT, PEPPER BRAND, or STINKING RUST, in which, while the grain retains its usual form and appearance, the interior of it is filled with a powder of a very fetid odor, consisting of balls so minute that it is calculated that four millions of them may exist in a single grain. These are a parasitic fungus, *Uredo caries* (*U. fætida* of some botanists). See SMUT.—The name B. has been frequently applied to diseases which seem to result from errors in the manuring of land, by which crops are often seriously injured. Unhealthy plants are most liable to be attacked by parasitic fungi, and by aphides and other insects, to which the origin of the evil has often been, probably by mistake, ascribed. Mr Berkeley, a high authority on such subjects, states also that 'there is a kind of B. sometimes very prevalent, which has been referred to fungi, but which is, in fact, nothing more than an excessive development of the epidermal cells, which are no longer kept within

bounds by the real cuticle,' but become 'elongated and frequently branched in various ways, so as to form spongy or mealy patches, which are sometimes in such abundance as from their bright color or peculiar aspect to attract general notice.' He adds that this is most common on woody plants, as vines and hawthorns, but that something analogous is to be seen on a few herbaceous species, 'a mere hypertrophy of the epidermal cells, or, indeed, mere fascicles of pubescence.' This kind of B., however, does comparatively little injury.

BLIN, *blāng*, FRANÇOIS: 1827-1866; b. at Rennes: French landscape painter, who learned of his master, M. Picot, only how to handle the brush, and followed his own inspirations in executing his landscapes, which were generally taken from nature. B. made his début in the Salon of 1852 with a *View of the Shores of Brittany*, and another landscape that was animated by a band of Bohemians. He took part in all the expositions at Paris, 1852-66, except that of 1855. To the Salon of 1859 he sent two paintings—*Morning on the Heath* and *After the Storm*, which were very favorably received, and particularly admired for their penetrating expression of solitude and silence. He had now found the direction best suited to his talents, and continued to represent on canvas the poetry of the most rugged sites, the gloominess of the shores of Brittany, the solemn stillness of the deep woods, the melancholy aspect of the heaths of Sologne. In 1865 he had on exposition a *Summer Evening in Sologne*, the best work he had yet produced, and for which he received a medal.

BLIN, FRANÇOIS PIERRE: 1756-1834; b. Rennes: a French physician.

BLIN, JOSEPH: 1763-1834; b. at Rennes: French statesman; brother of François Pierre B. He enlisted as soldier at the age of 16 years, served in the Antilles, returned to France, 1783, and declared himself emphatically in favor of the revolution when it blazed forth some years afterward. In 1792, he served as volunteer against the Prussians, and obtained the rank of captain. The following year he led a company of national guards against the Vendéans. In 1798, he was elected deputy to the council of five hundred. Under the Consulate and the Empire he kept aloof from politics, and became post-master of Rennes. He was deprived of his place by the Bourbons in 1815. and refused to retake it in 1830.

BLIND, *blīnt*, KARL: German author and revolutionist: 1820, Sep. 4—————; b. Mannheim. For his activity in the revolutionary movement of 1848 he was sentenced to 8 years imprisonment, but was rescued by the populace. In 1852 he found it necessary to take refuge in London for 15 years, till being pardoned by the govt. of Baden he returned to Germany. He was always an advocate of extreme democratic principles in govt. In literature, his work comprises numerous magazine articles and volumes in various departments of politics, history, mythology, and Scandinavian folk-lore, with biographies of Ledru-Rollin Deák, and Freiligrath.

BLIND.

BLIND, a. *blind* [AS. *blind*; Goth. *blinds*; Ger. *blind*; Icel. *blindr*, blind—connected with *blink*]: deprived of sight; wanting discernment; heedless; inconsiderate; morally depraved: V. to deprive of sight; ∞ darken; to deceive: N. something that darkens or obscures; a cover or screen; a pretense. **BLINDING**, imp. **BLIND'ED**, pp. **BLIND'LY**, ad. *-li*, in a manner implying blindness; without examination. **BLIND'NESS**, n. want of sight; intellectual darkness. **BLINDS**, n. *blindz*, in *mil.*, a temporary defense in presence of an enemy, made of branches interwoven. **BLINDAGE**, n. *blind'aj*, in *mil.*, a single or double row of beams leaning against a wall or parapet, and covered with sand-bags, or earth and fascines. **BLIND FOLD**, v. [AS. *blind*, blind; *fyl-lan*, to strike, to fell—*lit.*, to strike blind]: to make blind; to hinder from seeing: **ADJ.** having the eyes covered; having the mental sight obscured, as 'he walked into the danger blindfold.' **BLINDFOLDING**, imp. **BLINDFOLD'ED**, pp. **BLINDMAN'S-BUFF** [Ger. *blinzel maus*]: a play or game, in which one having his eyes covered tries to catch any other of the players. **BLINDMAN'S-BALL**, a common fungus or puff ball, of the genus *Lycoperdon*, full of dust when ripe. **BLIND COAL** (see **ANTHRACITE**), those coals which deficient in bitumen, burn away without flame. **BLIND-FISH**, an eyeless fish, *Amblyopsis spelæus*, found in Mammoth Cave in Kentucky. **BLIND HOOKEY**, a game of chance at cards requiring no skill, but only guessing what card will turn up in cutting the pack—that is, lifting a number of cards at one time from the pack. **BLIND SIDE**, the side on which danger is least perceived; a familiar term for a weakness or foible. **BLIND-WORM**, a small reptile covered with scales, and having a forked tongue, but harmless—called also **SLOW-WORM**. **BLIND-NETTLE**, or **DEAD-NETTLE**, a nettle which does not sting—so named as *blind* or wanting in stinging properties: see **NETTLE**. **A MERE BLIND**, something done openly as a cover for a secret design. **A BLIND ALLEY**, an alley or lane with no outlet; a cul-de-sac; called in Scot. 'a close.'

BLIND, THE: those either partially or totally lacking the sense of sight. Only a few are born blind, the greater number becoming so by accidents, small pox, or diseases of the eye (q.v.), so that more than one-half are above the age of 50. Blindness (q.v.) prevails most in tropical, and least in temperate countries; more in the eastern than the western hemisphere. The blind often show mental peculiarities. The balance between the outer and the inner world being disturbed, there is a tendency among the blind to self-consciousness, self-opinionativeness, and a desire to become the objects of attention, and, if possible, surprise, if not admiration; hence, there is more avowed infidelity than in any other class, although probably much of it is assumed, to attract attention, and display their controversial powers. As these tendencies are not strong in individuals, but become intensified when they are congregated together, it is now generally admitted that the more they associate with the seeing, and the less with one another, the better.

The first institution for the blind was founded in Mem-

mingen by Weef VI., 1178; the second, in Paris, by St. Louis, 1260; the first for the employment of the adult blind was opened in Edinburgh by Dr. Johnson, 1793. There are (1894) in the world about 260 institutions of various kinds for the blind; in the United States 36 (mostly very large). Though the blind, in general, are more or less dependent, yet many have earned a comfortable living, and even attained distinction in departments generally supposed inaccessible to them. The employments most adapted to their abilities are the making of baskets, brushes, mattresses, rugs, and such like; and for the women, sewing, knitting, and hair-plaiting. Many also have successfully competed with the seeing as musicians, music-teachers, and piano-tuners.

PRINTING FOR THE BLIND—The first embossed book for the use of the blind was printed in Paris, 1784, by M. Valentine Houy, from flat movable letters, which his pupils had been previously taught to put together and read. Founts of types were cast and books printed; and having been approved by the Acad. of Sciences, and exhibited before the royal family at Versailles, the art created at the time a great sensation. Large editions of a few volumes were printed at great expense; but as they were not easily read, and were used only for exhibition in the Paris Institution, the interest soon died away, and the greater part of the editions was years afterward sold for waste paper.

Printing is of use to the B. chiefly for those gems of literature which can be read and re-read with interest. It is questionable, therefore, whether the art, after falling into abeyance for about 40 years, would have been permanently revived, had it not been for the Bible, the book least wanted in Paris, but most wanted in Britain and America. Its revival in Britain is due to James Gall, of Edinburgh, who having in 1826 seen specimens of the Parisian books, and obtained a box of the types, was impressed with the importance of putting the Bible into the hands of the blind, to employ their sadly vacant hours. Being himself a printer and publisher, he at once saw the cause of the failure in France, and set himself to improve the alphabet, so as to make it more sensible to the touch. The following is a specimen of the Parisian type at that time: *

King of Jerusalem

The principles which he laid down for his guidance were these: *First*, that the common alphabet (modified so as to be easily felt) is the only safe basis on which a literature for the blind can rest. He did not believe that any arbitrary character would be universally adopted or permanently adhered to; and as he looked forward to the blind being taught in common schools, not only to read, but to communicate with their seeing friends, he thought it in-

* In this, as in all the specimens which follow, the size is reduced to one quarter—that is to say, they are half the length and half the breadth of the originals.

dispensable that the books should be legible to all. *Second*, that the printing should be so large and legible that the adult blind should be able to read it *fluently*. It would have been easy to print books in a small type, which could be read by children only, and which, besides being much cheaper, would have astonished the public more; but he was of opinion that unless the adults were able to read easily, the books would not be read in private, and the object he had in view would not be attained. He also unhesitatingly preferred the common (lower-case) alphabet to the capitals, which, though sufficiently well known, are not fitted for the use of the blind. Their symmetry and general uniformity, which specially adapt them for titles and inscriptions, render them unsuited for common and easy reading, either for the blind or those who see. They are even less adapted for the finger than the eye, because the eye can see the interior parts of the letters by which they are distinguished; whereas the finger can feel only the exterior form. Thus **E H K M N X Z** appear to the finger as a succession of squares, **O C G Q** as a succession of rounds.

In 1827, after much study and many experiments, Mr. Gall printed his 'First Book' for teaching the blind to read in a triangular modification of the common alphabet. The embossing was in high relief, and although it presented rather a rude appearance, being printed from wooden types, it excited great interest and wonder when it was found that the blind could read it easily with their fingers. This was followed by other little volumes, including a series of *Scripture Statements*, and a condensed *Epitome of Old Testament History*. These were received with so much favor, that in 1829 he issued a prospectus for the publication of the gospel by St. John, at one guinea, which was to pay not only for the copies, but preliminary expenses. This work was printed 1832, but was not published till 1834; the delay being caused by the efforts of some zealous friends to induce him to adopt some arbitrary alphabet before printing the Bible, which, however, he firmly declined to do. The consequence was that, in 1832, the Scottish Society of Arts offered a gold medal, value £20, for the best alphabet for the blind; and this, although it increased the public interest in the newly revived art, had also the effect of paralyzing Mr. Gall's efforts, by preventing the public from giving him support until the result of the competition thus created had been ascertained. It would have greatly strengthened his hands if, as he hoped, they had awarded him the prize, for there was no other in the field; but after waiting two years, he could wait no longer, and in 1834,* he published his great work, *The Gospel by St. John*, the first book of the Bible ever printed in any language for the blind. This volume was in a type so large and legible, that some of those whom he had taught were able at the public meetings to read any


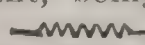
* The award was not made till 1837. Sixteen arbitrary alphabets had been sent in, all of which were rejected, and the prize was awarded to a Dr. Fry, of London, who had suggested the use of Roman capitals, which had been tried in America, 1834.

BLIND.

passage put before them through six plies of silk between the book and their fingers.

BEHOLD THE LAMBS OF GOD

To make known the literature thus provided for the blind, Mr. Gall visited England and Ireland, as well as different parts of Scotland, teaching the blind who were brought to him to read and write in a few lessons. The writing apparatus will be described hereafter. Letters thus written were transmitted by post, and as the same alphabet was used both inside and without, not only were the sealed contents read by the blind to whom they were sent, but the addresses also were read by the postmen who delivered them. Great interest began to be excited throughout Britain, and even in foreign countries. Abbé Carton was sent by the Belgian govt. to visit Mr. Gall's establishment, and returned to set up a printing-press in Brussels, which has continued to supply books for that kingdom. Dr. Samuel G. Howe, from Boston, visited Scotland, and having received from Mr. Gall all the information which he could supply, established on his return to America a printing-press in the Perkins Institution. In 1834 he published the Acts of the Apostles, and completed the New Testament 1836. About the same time, Mr. Jacob Snider of Philadelphia, not knowing what had been done elsewhere, published the gospel by Mark, 1834; but as he had unfortunately adopted the capital alphabet, his books could not compete with Dr. Howe's; and after printing the gospels and a few other volumes his press ceased to be used. Dr. Howe, on the contrary, had adopted an angular modification of the common alphabet, similar to, but much smaller than Mr. Gall's, and with that printed the whole Bible, besides an ever-increasing number of other volumes in all departments, which has been the supply for the United States. In Paris, also, the art was revived with great vigor, and a number of printing-presses were established in different parts of the continent.

Having thus succeeded so far as the blind were concerned, Mr. Gall was next anxious to improve the printing and lessen the cost, so that any village printer could make it part of his ordinary trade, without requiring subscriptions from the public. By careful experiment, and with the help of his son, he was enabled to make the alphabet assume more of its usual form without losing its tangibility, and to enrich the sentences by the introduction of initial capitals for proper names, etc., as in common books. But the most important improvement consisted in the use of serrated types, by which the letters were formed of dots  instead of lines. By this means the impression was not only sharper and more easily felt, but also more permanent, being better supported, as if by a series of arches,  like corrugated zinc roofs. It was also found that when the paper was thus semi-punctured

BLIND.

instead of being embossed, the common printing-press could print the sheets with half the pressure, and in half the time: and as the paper did not need to be nearly so thick as formerly, the books could be produced at one-half of their former cost. In 1836, therefore, he offered to societies and publishers, to print books for the blind in the improved type at so much per sheet, as an ordinary business transaction, without either subscriptions or donations. Of this offer the London Sunday School Union, the Religious Tract Soc. and the British and Foreign Bible Soc. availed themselves in 1837; and in 1838 he printed for the British and Foreign Bible Soc. the gospel by Luke and the Acts of the Apostles (two of the eight vols. of the New Testament), which they were able to sell at 4s. each: and here ended Mr. Gall's labors for the blind, extending over a period of twelve years, during eleven of which (1826-37) he had been alone in the field.

As the institutions for the blind in those days 'had not hitherto (as they expressed it) patronized any device of this kind,' Mr. Gall had to contend single-handed with all the apathy and incredulity which every new thing has to encounter. But now the tide had turned; readers were multiplying over the country, schools for the blind were beginning to be formed, the institutions abroad had all 'patronized the device,' and printing-presses were busy both in America and on the continent; so that when the Sunday School Union, the London Tract Soc., and the British and Foreign Bible Soc. began to publish class-books, tracts, and Bibles for the blind, they all at once became convinced of its importance, and took it up with so much energy, that there was now no longer any danger of its being abandoned; and as Mr. Gall's work was thus practically accomplished, it was neither his interest nor his inclination to compete with them.

The first, and by far the most energetic, of the number was Mr. John Alston of Glasgow, who, having established a printing-press in the Blind Asylum, of which he was treasurer, printed in 1837 the gospel by Mark in the same type in which (unknown to him) it had been printed in 1834 by Mr. Snider in Philadelphia. Through his influence it was at once adopted in the other institutions throughout the kingdom; and, having thrown himself with much enthusiasm into the work, he very soon raised funds by which he completed the New Testament 1838, and the whole Bible 1840. To him, therefore, belongs the honor of having printed the first complete Bible for the blind in any language, because Dr. Howe of Boston, although he commenced the work earlier, did not finish it till 1842. The effect was immediate and decisive: rivalry was extinguished, hundreds of the blind were brought under instruction, and reading was thenceforth acknowledged to be a necessary department of the education for the blind.

If Mr. Alston had adopted a modification of the low-case alphabet, and more especially, if he had printed his books in a much larger type, they would have been an

BLIND.

unspeakable blessing to the blind in Britain; because, not only would they have been universally adopted, but they would have continued to be used, and the lamentable confusion into which the printing for the blind in that country has fallen would have been avoided. But unfortunately, Mr. Alston being encouraged by the decision of the Scottish Soc. of Arts, which he himself had very much helped to influence, fell into the double error of adopting the Roman capitals for his alphabet, and making his type too small. The consequence was, that a reaction very soon took place, the blind themselves being the first to rebel. The want of sufficient legibility was in their judgment a fatal objection, and outweighed all other considerations. Even the large amount of money that had been expended, and the extensive libraries that had been formed through Mr. Alston's energetic labors, they were prepared to sacrifice, in order to obtain books which they could read with ease.

BEHOLD THE LAMB OF GOD

Gall's Serrated Type (*New Testament*, £1, 12s.)

behold the lamb of God

Howe's American Type (*New Testament*, 16s.)

BEHOLD THE LAMB OF GOD

Alston's Glasgow Type (*New Testament*, £2.)

The second in the field, or rather one simultaneous with Mr. Alston, was Mr. Lucas of the Bristol Institution, who invented a most ingenious system of stenographic printing with arbitrary characters and numberless contractions,

* 5707C 1 1.~9 01 ~

by which he secured largeness of type and at the same time diminished the size of the books. He had in 1837 printed the gospel by John, and in 1838 the Acts of the Apostles, but during the triumph and rapid multiplication of Mr. Alston's books little attention was paid either to him or his system; but when the tide turned, and legibility became the great desideratum, the value of his invention became apparent, and in 1839 a society was formed to aid Mr. Lucas in printing the Bible and teaching the blind to read upon his system. The blind were delighted with his books; his printing establishment was removed to London; large funds were collected; and the whole Bible and many other books were printed. (*Price of the New Testament*, £2.)

The third competitor was Mr. Frere of London, whose objections to Mr. Lucas's system were so strong, that he

* In this, as well as in the specimens which follow, the words are:
'BEHOLD THE LAMB OF GOD.'

BLIND.

was induced to devise another, which was (as he himself described it) 'a scientific representation of speech, the alphabet containing only one character for each of the simple sounds of the English language.' This opinion was shared by another large section of the friends of the blind; and accordingly, in 1839, another society was formed, another Bible was printed, another literature was created, and another illustration was supplied of the difficulty of securing the universal and permanent adoption of any

J - o u \ _ / u > v r

arbitrary character for the blind. Mr. Frere had the merit of inventing the 'return lines'—that is to say, the lines in his books are read from left to right and from right to left alternately, the letters themselves being reversed in the return lines. He devised also a cheap and very ingenious method of setting up and stereotyping his books, the letters being formed of small bits of bent wire laid on a tin plate, and fastened with heat. (*New Testament*, £2, 10s.)

The fourth competitor was Dr. Moon, of Brighton. He, too, uses an arbitrary alphabet, some of the characters resembling or suggesting the letters which they represent. He has also adopted Mr. Frere's 'return lines,' but does not reverse the letters as Mr. Frere does. Dr. Moon's printing is larger than any other, and therefore more easily felt. This is a great advantage to beginners, and to those whose touch is obtuse; and although no doubt his books are on that

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account bulky and expensive, nevertheless they are great favorites with the blind. A society, having numerous branches, has been formed to extend this system, and the blind are sought out and taught in their homes. In Britain many more blind persons can read on Dr. Moon's system than on any other. Besides the Bible, there is an extensive literature in English and other languages. In the United States also Dr. Moon's type is used in some institutions.

A fifth system, devised 1829-34 by Louis Braille, of Paris, (1809-52), is much used. It consists of the sixty-two varieties of form which six dots, $\begin{smallmatrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{smallmatrix}$, can be made to assume by the omission of one or more of them. This supplies not only the letters of the alphabet, but numerous other signs, o

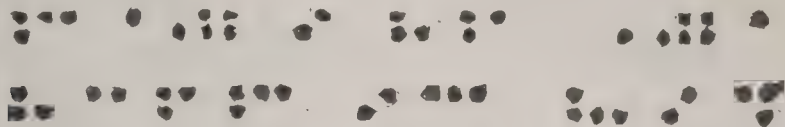
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which he makes valuable use. Point systems have advantages over the others: (1) they can be learned and used by many who could not learn the old system; (2) they can be written easily by the blind themselves, by an apparatus de-

BLIND.

scribed below; (3) these systems afford the best method of writing and printing music for the blind which has yet been discovered.

A sixth system is an improvement on Braille, by W. B. Wait of New York, which, it is confidently predicted, will supersede all the others. The signs, like M. Braille's, are produced by six dots, but they are placed horizontally, thus, :::



This method, known as the New York point, is now generally adopted in the United States; though Dr. Howe's or the Boston type, in which most of the literature for the blind has been prepared, is still largely in use. The two establishments for printing for the blind in this country are the American Printing House for the Blind, Louisville, Ky.; and the Howe Memorial Press, at the Perkins Institution for the Blind, South Boston, Mass.

WRITING FOR THE BLIND.—This is of two kinds: first, writing to be read *by the blind*; and, second, writing by the blind to be read *by the seeing*. Messrs. Milne and M'Baine of the Edinburgh Asylum invented the 'string alphabet,' by which they were enabled to communicate with one another. The letters were represented by different kinds of knots tied upon a cord singly or combined. This was superseded in 1838 by Mr. Gall's writing stamps, which, as they can be made to any pattern, have been much used. The paper is placed on a cushion frame, and a barred guide placed over it. The stamps are made of pins fixed in wood, and, when pressed through thick writing-paper, produce a raised letter on the other side.

M. Braille's system of writing corresponds with his alphabet. Cartridge-paper is placed over a grooved plate, with a guide having two rows of oblong holes. A blunt point forces the paper into the grooves, so as to produce the dots which form the letters on the other side. This is by far the most legible writing which has yet been provided for the blind, and is a strong recommendation of his alphabet for printing.

There are two methods of writing by the blind to be read by the seeing. The first is by Mr. St. Clair, a teacher of music in Edinburgh; the other is Mr. Gall's Typhlograph. In both processes, the writing is produced by a hard pencil with a fine point, or by a blunt bodkin moving over carbonized paper, which deposits the blacking on the paper wherever it is pressed. Mr. St. Clair's guide consists of a line of small square holes, each of which represents a letter or a space. The steel point enters each hole, and makes a

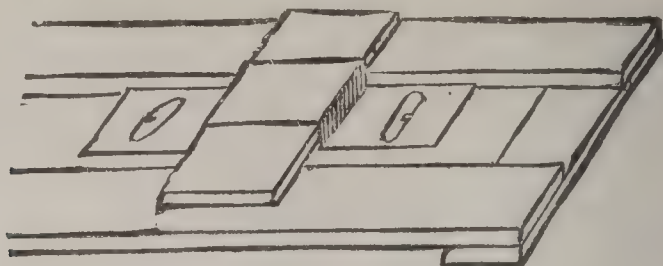



ST. CLAIR

letter, guided by the four sides. Mr. Gall's Typhlograph is a

BLIND.

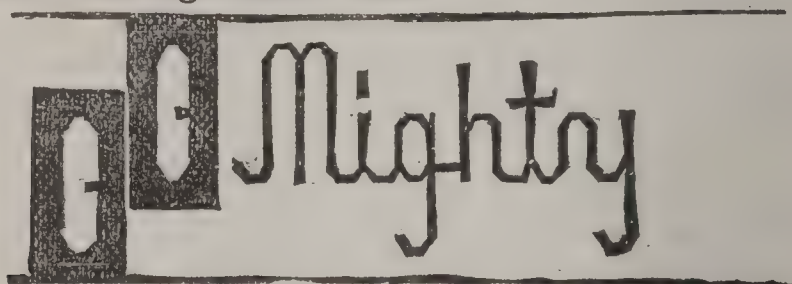
much more perfect instrument; and can be made to imitate any size or style of writing; but it is not so easily made. It

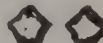


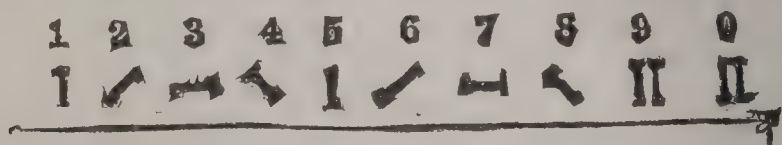
consists of a hole of this shape,  cut in a thin brass guide which slides freely between two wooden fillets, united at each end. The upper half of the hole is used when the guide leans against the lower fillet, and the lower half is

Commandment

used when the guide leans against the upper fillet. When the steel point has traced a line round the upper or lower half of the hole, it is stopped by the small projection in the middle of the right side—thus:



ARITHMETIC FOR THE BLIND.—There are three methods: 1. The *Parisian*. Embossed types are dropped into square holes in a perforated board, and read by the finger. 2. *Saunderson's*. Angular pins are dropped into angular holes, and indicate the figures according to their position. The pentagonal is the most convenient form, because one pin having the two ends different can  represent ten ciphers. 3. *Gall's* requires no apparatus at all, the ciphers being represented by common pins stuck into a quilted cushion or cloth of any kind, and the lines by twine stretched across—thus:



Although reading, writing, and tangible arithmetic are of great importance to the B., yet oral instruction is the chief reliance. In this country, in many states, schools for the blind are no longer charitable institutions, but have their place under the state board of education: about 3,000 are in schools. The blind are better cared for than in any other country.

BLIND COAL—BLINDNESS.

BLIND COAL: see ANTHRACITE.

BLINDNESS: lack of sight, due to some intercepting of the rays of light passing to the optic nerve, or to disease of that nerve, or of the part of the brain connected with it. B. may vary in degree; may exist from birth, or result from old age; may be present only by day, or by night, or a few weeks in a year, or permanently.

Congenital B. is generally from some deficient development of the nervous apparatus, and is detected by the child being indifferent to light, and throwing its head from side to side. Occasionally, but very rarely, the power of vision is afterward developed.—See AMAUROSIS: EYE: VISION.

Opacity of the vitreous humor, or of the crystalline lens—the latter is generally known as cataract—causes B., which comes on gradually. The patient with cataract can see best in the evening, or when the pupil is dilated, as then some rays of light are able to enter by the side of the opacity. The B. from cataract is seldom so complete as to prevent the person from distinguishing day from night, or from being aware of opaque bodies passing between him and the light (see CATARACT). Opacities of the cornea, if extensive, or in the axis of vision, produce some degree of B., whether they are on or in its substance. In general, these are irremediable; but if there is a spot, an artificial pupil may be made. Some years ago, Mr. Bowman, of London, met with a case in which the opacity consisted of a layer of phosphate and carbonate of lime: he removed it, and restored the vision, which had been totally lost for several years.

Night B. is a rare condition, in which a person finds, toward evening, that objects are becoming less and less distinct, and at last that he is totally blind. This may occur without previous warning, and cause great alarm, but next morning he finds that his sight is restored. This is repeated every night, but at last the eyes become weak during the day also, and may finally become amaurotic. This strange affection may be epidemic; it has attacked bodies of troops exposed to great fatigues and the glare of the sun's rays. If there are no symptoms of disease within the brain, recovery generally results from protecting the eyes from the light, entire repose, such remedies as correct any constitutional defect in the individual attacked, and repeated blistering.

Day B. is characterized by inability to see in a bright light; the subjects of it see more than usually well at night, but during the day have to be led about. Captives long immured in dark cells are often affected with it, as a galley-slave, who had for 33 years been shut up in a subterranean dungeon, when liberated could see only by night.

Recent advances in knowledge of the anatomy of the eye (see EYE), with the discovery of the ophthalmoscope, and improved methods of examining the eye for errors of refraction, enable surgeons to improve vision in cases which 30 years ago would have been hopeless; but it should be remembered that overwork wears out the eyes; and it should be strongly impressed, especially on the young, that if vision fails when the eyes are used continuously on fine work, such as reading or sewing, it is best to consult an oculist—

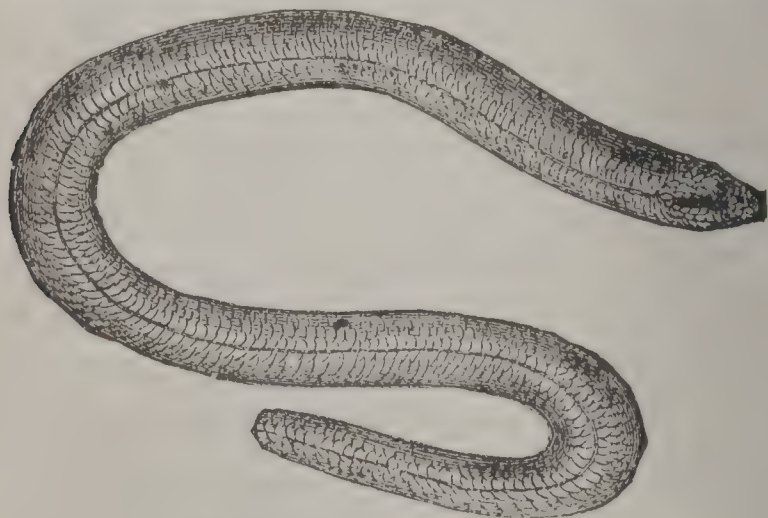
BLINDNESS—BLINDWORM.

not an optician—and to submit the eyes to a thorough examination. Probably such an examination will show some error of refraction which when properly corrected by suitable glasses will enable the patient to use the eyes with comfort. See ASTIGMATISM: MYOPIA: ETC.: also BLIND, THE.

BLIND'NESS, COLOR: see COLOR BLINDNESS.

BLIND'STORY: name for the *triforium* (q.v.), the second or middle arcade in the wall which separates the body from the aisles of a church. It is so called obviously as opposed to the *clearstory* or *clerestory* (q.v.), the third and uppermost arcade, the apertures of which admitted light into the church, while the apertures of the triforium were dark—*obscuræ fenestræ*, as they are termed by Gervase of Canterbury. The B., which is most usual in cathedral, conventual, and collegiate churches, served to give access to the various parts of the building, and to suspend tapestry and banners on high holidays. Viewed æsthetically, the gloom of the B. contrasts well with the lustre of the clerestory.

BLIND'WORM (*Anguis fragilis*): small reptile, commonly ranked among serpents by naturalists, in consequence of agreement in general form, but showing remarkable points of difference from the true serpents, and forming one of an interesting series of links by which they are connected with lizards. Mr. Gray has therefore recently united this, and other nearly allied genera, with the Scink and Seps family of saurian reptiles under the name of *Saurophidia* (Lizard-serpents), among which the gradation from the lizard to the serpent structure is marked by the more and more complete disappearance of limbs, and the increasing elongation of the body. In the genus *Anguis*



Blindworm (*Anguis fragilis*).

there is no trace of limbs externally, but the bones of the shoulder, the sternum or breast-bone, and the pelvis still exist in a rudimentary condition: the bones of the head, also, connect it with lizards, and do not admit of that dilatation of the gape which characterizes true serpents. The common B. is found in almost all parts of Europe. It is entirely inoffensive, although generally persecuted by the

BLINK—BLISS.

ignorant as extremely venomous. Its teeth are so small that even when it attempts to bite, which it only does upon much irritation, it cannot pierce the skin. No species of the group to which it belongs has poison-fangs. It is very timid, and when alarmed contracts itself forcibly, and then becomes remarkably brittle, so as to be easily broken in two by a blow or by an attempt to bend it. This character of fragility is found also in other animals of this group. The name B. has apparently originated in a mistake caused by the smallness of the eyes, which, however, are very quick and brilliant. Another common name, *Slow-worm*, is more accurately characteristic. The length varies from 11 to 15 inches, and sometimes even exceeds this; the thickness is almost equal throughout, the tail is blunt at the end; the scales are small, and nearly equal; the tongue is notched at the extremity, but not bifid as in snakes; the color is generally silvery gray, a dark line runs along the back, and frequently there are rows of dark spots along the sides. The food of the B. consists of slugs and insects. It retires in autumn under masses of decayed wood and leaves, or into soft dry soil. It changes its skin. It is viviparous (ovoviviparous), the number of young varying from 7 to 12 or 13 at a birth. The name B. is sometimes given to *Cecilia* (q.v.).

BLINK, n. *blīngk* [AS. *blīcan*, to dazzle: Ger. *blīcken*, to shine, or *blīnken*, to twinkle]: a twinkle or glimpse of light; a wink; a glance; a look; a moment; a very brief time: V. to wink; to twinkle with the eye; to see dimly or obscurely; to evade. **BLINK'ING**, imp.: **ADJ.** having obscure vision; dim-sighted. **BLINKED**, pp. *blīngkt*. **BLINKER**, n. *blīngk'ēr*, one who or that which. **BLINK'ERS**, n. plu. *-ērz*, coverings for the eyes of a horse to keep it from seeing on either side. **BLINKY**, a. *blīnk'i*, liable to wink by overstraining the eyes. **TO BLINK THE QUESTION**, to shut one's eyes to it; to make one's self wilfully blind to it. **SNOW OR ICE BLINK**, the peculiar reflection from snow or ice in arctic regions.

BLISS, n. *blīs* [AS. *blīs*, joy; *blīthe*, merry, joyful: Bohem. *blaze*, happily (see BLESS)]: happiness in a very high degree; felicity; joys of heaven. **BLISS'FUL**, a. *-fūl*, full of bliss. **BLISS'FULLY**, ad. *-lī*. **BLISS'FULNESS**, n. the state of exalted happiness; felicity. **BLISS'LESS**, a. without bliss.—**SYN** of 'bliss': happiness; felicity; blessedness; blessing; beatitude; joy; enjoyment.

BLISS, DANIEL, D.D.: missionary: 1823, Aug. 17———; b. Georgia, Vt. After preparing at Kingsville, O., Acad., he entered Amherst, where he graduated 1852. He studied at Andover Theol. Sem. 1852–55, and was ordained to the Congl. ministry. During the next 6 years he was a missionary of the Amer. Board at Mt. Lebanon, Syria; then for two years sec. to the Amer. Board in New York; afterward for two years working in England for the Protestant Coll. at Beyrout, Syria, of which he became pres. 1864. He is author of several philosophical works in Arabic.

BLISS—BLISTERED STEEL.

BLISS, EDWIN ELISHA: D.D.: missionary: 1817, Apr. 12—1892, Dec. 29; b. Putney, Vt. He graduated from Amherst Coll. 1837, was a teacher in Amherst Acad.; then took a full course at Andover Theol. Seminary, graduating 1842, and being ordained to the Congl. ministry 1843. He served as missionary 1843-52 at Trebizond, and 1852-56 at Marsovan in Armenia. In 1856 he went to Constantinople, where he remained until his death. He received his degree of D.D. from Amherst 1869. After 1865 he edited *The Messenger* at Constantinople in the Armenian and Turkish languages. He was skilled in eastern languages and also compiled books useful in missionary work, such as the *Bible Handbook* in Armenian.

BLISS, PHILIP PAUL: evangelist and singer: 1838, July 9—1876, Dec. 29. He passed his early life in the Penn. and Ohio wilderness, becoming, even in early boyhood, a singer of remarkable power and sweetness. He taught school in Hartsville, N. Y., 1856, and soon afterward began to teach music and compose songs and hymns, which he sang in public with great effect. He had joined a Bapt. church; and having come under the influence of Mr. Moody, he gave himself to fervent and fruitful unsectarian evangelistic work from 1874, and his name became widely known. One of his most popular songs is *Hold the Fort*, founded on an incident of the war; others were *Pull for the Shore*, *Hallelujah! 'tis Done*. He lost his life in the Ashtabula (O.) railroad disaster.

BLISS, PORTER CORNELIUS: journalist: 1838, Dec. 28—1885, Feb. 1; b. Erie co., N. Y.; son of a missionary to the Indians in w. N. Y. He obtained his education at Hamilton Coll. and at Yale, and made a special study, 1860, of the condition of the Indians of Maine and the seaboard provinces. He went to Brazil in 1861 as private sec. to the U.S. minister, and studied the Argentine Indian antiquities and dialects, 1862, under a special commission. B. was private sec. of the U. S. minister to Paraguay 1866, and there fell into trouble with the govt., being saved from death only by the determined action of the American govt. backed by a naval squadron. The latter part of his life was passed in literary work, though he was sec. of legation in Mexico 1870-74.

BLISTER, n. *blis'tér* [AS. *blæsan*, to blow: Icel. *blastr*, the blowing of a bellows; *blasa*, to blow: Dut. *bluyster*, a blister]: a thin white swelling on the skin, generally filled with watery fluid; in *med.*, a plaster composed of such a substance as when applied to the skin raises vesicles filled with serous fluid; the scales on iron or steel: V. to raise blisters; to rise in blisters. BLIS'TERING, imp. BLIS'TERED, pp. *-têrd*. BLIS'TERY, a. *-têr-î*, full of blisters.

BLIS'TERED, or BLISTER, STEEL: the kind of steel from which, by hammering, rolling, etc., certain qualities of tools and files are fashioned. When broken up,

BLISTERING FLIES—BLISTERS.

piled and welded under the hammer, it forms *shear steel* (see IRON), from which a finer class of tools is made, and when melted in crucibles it forms the finest kind of *cast steel* (q.v.) for cutlery. Blister steel is made from bar iron of superior quality by a process of *cementation*; and the furnace employed for the purpose is termed a converting furnace. It consists of two fire-brick rectangular chests or troughs, each 16 ft. long and 3 ft. deep by 3 ft. wide, as a maximum size, placed alongside each other in an arched chamber, and surmounted by a wide conical chimney. One long fire-place, with a suitable arrangements of flues, heats both chests. Into each chest the iron bars are laid embedded in charcoal, about half an inch of which intervenes between each layer of iron bars. The whole is then plastered over with clay or grindstone-dust, and kept at a glowing red heat from seven to ten days, according to the purpose for which the blister steel is intended. When the bars are removed after cooling, they are found to have undergone a remarkable change. They are no longer tough, but quite brittle and fusible, and covered over with blisters. During the process, the iron absorbs and combines with from a half to one and a half per cent. of carbon. The blisters are supposed to be due to the evolution of carbonic oxide arising from the combination of carbon with a trace of oxygen existing in the iron.

BLIS'TERING FLIES: see CANTHARIDES.

BLIS'TERS: medicinal agents which, when applied to the skin, raise the cuticle into small vesicles filled with serous fluid. They are applied either in the form of plasters or in a fluid state, as suits the convenience of the person or part, and have for their object the establishing of a counter-irritation or diversion of inflammatory action from a part in which it cannot be reached by remedies, or from some organ where it may do permanent mischief, to some part of the body nearer the surface.

The most common blister in use is made of cantharides (q.v.) or Spanish fly (*Cantharis vesicatoria*). Cantharides, mixed with a convenient proportion of lard and wax, form the blistering ointment of ordinary use; the only objection to this preparation being, that if applied too long it produces distressing affections of the urinary bladder. In young children and very thin-skinned persons, a layer of silver paper, or thin gauze wet with vinegar, may be laid between the blister and the skin. But under no circumstances should a blister be left long upon children, as it may produce sores which are apt to take on an unhealthy action, and are difficult to heal.

Mustard (*Sinapis nigra*) is frequently used, but seldom left on sufficiently long to produce blistering. Tincture of cantharides, croton oil, and strong liquor ammoniæ, tartar emetic ointment, and many others are used in practice.

If the occasion for the blister passes off, the vesicles should be pricked, and their fluid contents allowed to trickle away, the vesicated surface being then dressed

BLITE

with some cold cream or lard. But if it should appear desirable to promote a discharge from the skin, the raised cuticles may be snipped off, and the blister either applied again at intervals, or some stimulating ointment as the savine (*Juniperus sabina*) made use of. Great cleanliness should be observed in dressing the part.

Of late years, B. have been much used for the dispersion of glandular tumors, and are also applied over the surfaces of indolent ulcers, with the view of increasing the vascularity of the part. For old diseases of joints, B. ought to be placed at a little distance from the affected joint.

BLITE n. *blīt* [Gr. *bliton*; L. *blitum*, an insipid kitchen vegetable]: a kind of amaranth; a genus of plants called strawberry blite, from the fruit which succeeds the flower resembling small strawberries, ord. *Chen'ōpodīacēæ*.

BLITHE, a. *blīth* [AS. *blithe*, merry, joyful: Goth. *bleiths*, mild: Icel. *blithr*, bright, happy: Dut. *blijde*, cheerful]: gay; merry; joyous; sprightly; also in same sense **BLITHEFUL**, a. *-fā*, and **BLITHE'SOME**, a. *-sūm*, mirthful. **BLITHELY**, ad. *-lī*, in a cheerful, joyous manner. **BLITHE'NESS**, n. or **BLITHE'SOMENESS**, n. the quality of being cheerful and joyous; joyful mirthfulness. **BLITHE'SOMELY**, ad. *-sūm-lī*.

BLITZ, ANTONIO, Signor: magician: 1810, June 21—1877, Jan. 28; b. Deal, Kent, Eng.; d. Philadelphia. When 13 years old, he performed in Hamburg, Germ.; after travelling two years in n. Europe, returning to England he exhibited, 1825, Dec., in Dover, and also visited Ireland and Scotland. Coming to the United States, 1834, he performed in New York, then throughout the country, afterward in Canada and the West Indies, finally settling in Philadelphia. He recounted his experiences in *Fifty Years in the Magic Circle*, pub. Hartford, 1871.

BLIZZARD, n. *bliz'erd* [seemingly a popular variation from same root as *blow*, *blast*, *blaze*, combining the ideas of great force and extreme speed: compare also Ger. *blitz artig*, lightning-like, which R. H. Chittenden suggests as the origin of the word—quoting *Faust*, Part 2, Walpurgis Night, p. 303, Cotta's ed. 1859]: volley of fire-arms: thence, sudden overpowering attack with words: applied most frequently to a furious gale or storm of wind and drifting snow with severe cold—well-known on the great plains of the n.w. states and territories, particularly the Dakotas, as rushing with a fury not to be faced by man or beast.

A storm unprecedented for the region and called a B., raged over N. Y., N. J., Penn., and the New England states 1888, Mar. 11, 12, 13, and caused a loss of many lives, destruction of a great amount of property, and extraordinary delays in railroad and other means of transportation. In New York and vicinity rain began falling lightly Mar. 11, Sunday, about 3 P.M. About 7 P.M. it became heavier; at 10 it was pouring; and at 11 the rain changed to snow, and the wind, steadily increasing in violence, soon blew a full gale. By daybreak Monday

BLIZZARD—BLOAT.

there had been a heavier fall of snow than for several years, and the high winds had piled it in drifts in every direction. Through the day the wind averaged a velocity of 46 m. per hour, but there were frequent and brief squalls in which the velocity was much greater; direction of the wind due n.; temperature 15°. Before noon horse-car service in the cities within range of the storm was wholly suspended, and as the day wore on streets and roads became impassable, all railroad trains were blocked, telegraphic communication ceased, and telegraph, telephone, and electric-lighting poles, trees, chimneys, roofs, and other portions of building were blown down or far away. Snow ceased falling early in the afternoon, but the violence of the wind did not abate, and as the snow was very light the wind kept on piling it up in huge drifts and embankments. On Tuesday the wind continued at a velocity of 47-60 m. per hour, and the temperature ranged 8° to 15°. Toward night the wind began to subside, and on Wednesday the snow began to melt. Many railroad trains were helplessly snowed in, the region between New York and Pittsburgh *via* Philadelphia, between New York and Albany, and between New York and the cities on the Delaware Lackawanna and Western railroad appearing to have the worst drifts. The Pennsylvania railroad had more than 12,000 men at work nearly two days, clearing the track and extricating the storm-bound trains between Elizabeth and Jersey City alone. In New York the melting of the snow was expedited by fires of wood and oil kindled in the streets, and business was wholly suspended. The first train through from New York to Philadelphia left Jersey City at 6 A.M. on Monday, and reached Philadelphia at 5 P.M. on Thursday. On the Delaware river and the N. J. coast the injury to shipping was very great, over 30 vessels being sunk or stranded, and several seamen drowned. Short-distance travel by rail was partially resumed Wednesday morning, but the snow did not wholly disappear for several weeks.

BLOAT, *v.* *blöt* [Icel. *blautr*, soft: Dan. *blød*; Sw. *blot*, soft: *blöta*, to soften by soaking]: to cause to have an unsound swollen look; to swell; to puff up; to make vain; to make or grow turgid. **BLOAT'ING**, *imp.* **BLOAT'ED**, *pp.*: **ADJ.** having an unsound swollen look, as if soaked in water. **BLOAT'EDNESS**, *n.* the quality of having an unsound swollen look. **BLOAT'ER**, *n.* small fish partially dried, generally applied to half-cured herring.

BLOCH—BLOCK.

BLOCH, *blöch*, MARCUS ELIESER: 1723–1799, Aug. 6; b. Anspach, Bavaria: ichthyologist. He grew up in extreme ignorance till 19 years old; then studied medicine, surgery, and natural history in Hamburg and Berlin; took his medical degree at Frankfort; and practiced in Berlin till his death. He is best known for his *Allgemeine Naturgeschichte der Fische* (12 vols. Berlin 1782–95, with 432 colored plates), and his collection of fishes now in the Berlin zoological museum.

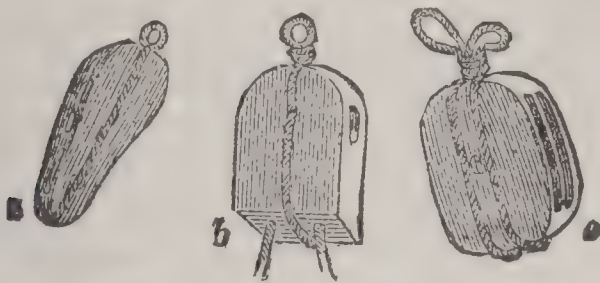
BLOCK, n. *blök* [F. *bloc*, a log or mass: W. *ploc*, a block: Gael. *bloc*, round: Dut. *blok*: Ger. *block*]: a thick log or mass; a heavy piece of timber or stone; any mass of matter; the lump of wood on which persons were beheaded; any hindrance or obstruction; the piece of wood in which the wheels of a pulley run; a row of houses: V. to shut up; to stop; to obstruct. **BLOCK'ING**, imp. **BLOCKED**, pp. *blökt*. **BLOCKHEAD**, n. *blök hēd*, a stupid fellow; a dolt. **BLOCK'ISH**, a. dull; stupid. **BLOCK'ISHLY**, ad. *-li*. **BLOCK'ISHNESS**, n. stupidity; dulness. **BLOCK LIKE**, a. resembling a block or blockhead. **BLOCK-TIN**, n. pure tin in stamped bars or blocks; also an inferior variety of tin. When the metal is reduced from its ores, it is first poured into molds, and the ingots thus procured are heated to incipient fusion in a reverberatory furnace, when the pure tin first fuses, and is withdrawn; and the less pure tin left behind, being melted at a higher temperature, is poured into molds, and is known as block tin (see **TIN**): **ADJ.** denoting a vessel made of double or triple plates of tinned iron. **BLOCK HOUSE**, n. a kind of fort chiefly constructed of hewn timber, loopholed for defense. **BLOCK-SHIP**, a vessel for the protection of a harbor—generally an old large one. Since war-steamers have almost superseded the old sailing men-of-war, the latter are of little service except as block-ships, or for training-ships. **BLOCK-SYSTEM**, the system of working a railway when it is divided into sections of 3 or 4 miles. generally between stations, having at the end of each a signal and a connection with the electric telegraph, so worked that no train is allowed to pass into any one section till it is wholly clear—thus between two successive trains there is not merely an interval of time, but an absolute interval of space. See **RAILWAYS** (*Signals*). **TO BLOCK OUT**, to sketch out the whole roughly, as a plan.

BLOCK, in the rigging of a ship: an important part of the apparatus for raising sails and yards, tightening ropes, etc. The B. comprises both the frame or shell, and the pulley or pulleys contained within it. In seamen's language, a *tackle* includes the rope as well as the B. through which it works. The uses of blocks are very numerous on shipboard; and they are distributed about the masts, yards, sails, and ropes. They vary greatly in size, shape, power, and designation; but nearly every B. comprises a *shell* or wooden exterior, a *sheave* or wheel on which the rope runs, a *pin* or *arle* on which the sheave turns, and a *strap* (of rope or iron) to fasten the B. to any particular station (see **PULLEY**). A single B. contains only one sheave; a double B., two; and so on. Besides the designations of blocks accord-

BLOCKADE.

ing to the number of sheaves they contain (*single, double, treble, fourfold*), ships' blocks receive numerous other names—such as *bee-B.*, *cut-B.*, *cheek-B.*, *clew-garnet B.*, *clew-line B.*, etc. Some of these names depend on the kind of service, others on the place of fixing; while the rest are examples of the odd nomenclature adopted by seamen.

Block-making.—Ships' blocks were made by hand until about a century ago. But mere workers in wood could not produce them; it required unusual skill and practice to fashion the several pieces, and put them together so as to possess the requisite strength and facility in working. The trade was carried on alone, or with mast-making. More than 1,400 such blocks were required for one of the old 74's, and a proportionate number for vessels of larger or smaller



Various forms of Ships' Blocks:

a, long-tackle block; *b*, clew-line block; *c*, double block.

size. 1808 the Brit. admiralty adopted Sir Mark Isambard Brunel's accurate and beautiful system of B.-making by machinery; he was paid £20,000 for his invention; and its annual saving to the govt. was more than that amount, with far better product. Recent improvements in blocks provide for decrease of friction: this is effected in one very large class by roller bearings. The hole through which the pin passes is considerably larger than the pin, and into the hole is inserted a roller bushing, which consist of a brass frame carrying generally 6, sometimes 8, rollers, which surround the pin and are parallel to it. Thus as the sheave turns, the rollers turn with it, rolling friction takes the place of sliding friction, and the sheave turns much more readily. In other systems anti-friction compositions are used to avoid friction. Instead of wooden shells for blocks, metal ones, often of open work, are sometimes used. Instead of rope straps, iron straps are now generally used.

BLOCKADE, *n.* *blök-kād'* [It. *bloccare*, to block up: Sp. *bloquear*, to blockade—from **BLOCK**, which see]: the surrounding or shutting up any place with a sufficient number of soldiers or ships, in order to prevent any intercourse with its inhabitants: *V.* to shut up a town or a fortress with an army or with ships, to compel its surrender. **BLOCKA'DING**, *imp.* **BLOCKA'DED**, *pp.* To **RAISE A BLOCKADE**, to withdraw, or to force or drive away, the troops or ships from their positions.

BLOCKADE', in a Military Sense: operation for reduction of an enemy's town or fortress, often without bombardment or regular siege, by preventing introduction of supplies or reinforcements. Every avenue of approach is guarded by the attacking force, which erects works on neighboring heights and roads; and troops are held in reserve to

BLOCKADE.

repel sorties. When the officer in command of a post foresees B. immediately imminent, he sends out of the place as many of the non-combatants and ineffectives as possible, collects the stores in bombproofs, and subjects to military regulation the food supply. When the opposing force begins construction of the B. works, he endeavors by frequent sorties to hinder the investment of the place. The most notable instance on record of military B. was the investment of Paris by the German armies 1870-1. There the inevitable result of the absolute stoppage of supplies was hastened by bombardment. At Metz, in the same war, a great army comparatively unencumbered by presence of a civil population, was compelled to surrender under stress of B. only, without bombardment.—See SIEGE.

BLOCKADE, in a naval sense, is prevention of entrance or exit of the enemy's ships at a particular port, or at all the ports on a stretch of coast: ships of neutrals are prohibited from intercourse with the enemy through the same ports. An attempt of a neutral ship to introduce supplies through a blockaded port, subjects the offending party to be treated as an enemy by the belligerent. But in order to create an obligation on the part of neutrals to abstain from attempting to enter a port proclaimed under B., the B. must be 'effective'—*i.e.*, maintained by a force sufficient really to prevent access to the enemy's coast. It is a growing practice among maritime powers for belligerents to notify diplomatically, to the neutral powers the fact that they have placed an enemy's port or ports under blockade. The act of sailing with intent to enter a blockaded port will warrant the capture of a merchant vessel by a belligerent cruiser on the high seas. A port having been placed under B., egress is prohibited to all neutral vessels, except such as entered before B. was established: even these must not take out cargoes, unless they were laden before the commencement of the B. The ancient usage was to confiscate both ship and cargo in case of breach of B., and to treat the crew as enemies; but now a milder practice generally prevails as regards captain and crew; often, too, a ship may be condemned, while her cargo may be released.—The most memorable of recent blockades is the B. of the ports of the s. states by the U. S. govt. during the civil war. Hobart Pasha, a noted B. runner, testified that of 66 ships sailing from England and New York to run the B., more than 40 were captured. The effect of this B. on prices in the south and in England was remarkable; Hobart sold in Liverpool for 60 cents a lb. cotton that in Wilmington, N. C., had cost him only 4 cents; he sold in Wilmington for \$3 a pair of corsets that he had bought in Liverpool for 60 cents. See CHARLESTON: NEUTRALITY: PRIZE COURT. Consult Hobart Pasha, *Sketches from My Life* (1866). For the law of B., consult Twiss, Hall, Phillimore, Hazlitt, and Roche for England, with Lord Stowell's decisions in the prize court during the French wars: Wheaton for the United States: Hautefeuille Heffter, Gessner, and Bluntschli for the continent of Europe: also the collections of treaties; and proceedings of the *Alabama Commission*.

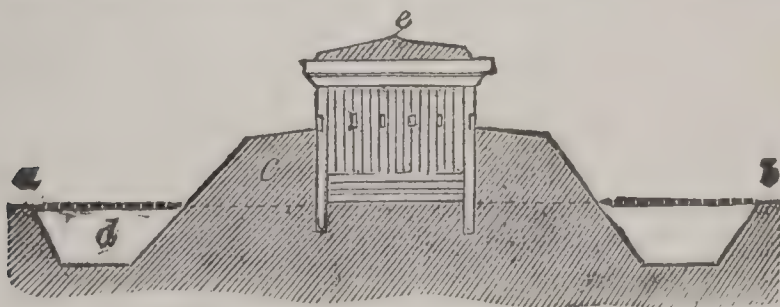
BLOCK-BOND—BLOCKHOUSE.

BLOCK BOND: in *bricklaying*, an arrangement in which 'headers' and 'stretchers,' or bricks laid lengthwise and crosswise succeed each other in alternate courses.

BLOCK BOOKS: see **PRINTING**.

BLOCK COAL: peculiar kind of coal occurring in the coal fields of Indiana. It breaks easily into large square blocks. In the smelting of iron, it is used either directly or coked.

BLOCK'HOUSE: kind of fort of logs or timber, built usually within a field fortification, thus providing a *keep* or place to which the defenders may retire for protection and to protract their resistance. In plan a B. may be square, rectangular, or even cruciform, according to locality and to the kind of fire that it is to deliver. The walls are usually of two rows of logs, the inner placed vertically, the outer horizontally and hewn so as to have a surface of contact of at least 8 inches. If intended to withstand artillery, these rows would be about 3 ft. apart, the space between them being filled with earth closely rammed. The roof is usually of logs laid horizontally, boarded so as to be water-tight, and covered with 3 or 4 ft. of earth, so as to make it fire-proof and splinter-proof. A B. within a field fortification should be so placed that all parts of the interior of the fortification may be commanded by, and seen from, the B. Its size depends on the number of defenders to occupy it. It should be free from dampness and well ventilated, and strong enough to resist the fire to which it is liable; a thickness of 40 inches is required to resist projectiles of field guns. Where not liable to artillery fire, the B. would usually have two stories, the sides of the upper story overhanging, or making an angle with those of the lower, so as to allow all parts of the building to be protected by its own fire. The walls are provided with loopholes for infantry fire, and with embrasures for cannon, where these are used. Additional protection is obtained for the walls by banking them with earth. Blockhouses have been much used in the United States for defense against Indians. In a wooded country they are easily and quickly constructed; and, in connection with stockades (similar structures without roofs), they form an efficient protection, capable of accommodat-



Elevation of Blockhouse.

ing a large number of defenders. The accompanying cut shows one of many kinds of blockhouses: *ab*, is the natural level of ground; *c*, the earth obtained from ditch, *d*, and banked against the walls; *e* is the earthen parapet on roof. The loopholes also are shown.

BLOCK ISLAND--BLOMARY.

BLOCK ISLAND, formerly **MAN'ISEES**: in the Atlantic, about 9 m. s. of the mainland; about 8 m. long, 5 m. wide; constitutes the town New Shoreham, Newport co., R. I. Numerous visitors resort there in summer. There are two churches and a high school.—E. of the island is an extensive breakwater, forming a harbor of refuge. A light house stands at the n.w. end, in $41^{\circ} 13' \text{ n.}$, $71^{\circ} 35' \text{ w.}$ Pop. (1890) 1,320; (1900) 1,306.

BLOEMFONTEIN: city and cap. of the Orange River Colony (name changed from Orange Free State by the British 1900, May 29), South Africa; on the Modder river, 200 miles w. by n. of Durban. It is built on an elevated site, and is connected with Natal and Cape Colony by telegraph. During the war between England and the Transvaal and the Orange Free State in 1899–1901 it was an important military post. When Lord Roberts was placed in supreme command of the British forces in South Africa he led an expedition against Bloemfontein, which surrendered, 1900, March 13, President Steyn escaping capture. Soon afterward the part of the republic held by the British was placed under British administration. The city is the seat of an Anglican bishopric.

BLOIS, *blwá*: town of France, cap. of the department of Loire-et-Cher. It has a remarkably fine situation on the acclivity of a hill, and is built chiefly on the right bank of the Loire, about 35 m. s.w. of Orleans. The houses, in the upper part of the town especially, are mean and ill built, and the streets are crooked and narrow, but they are kept clean by water from the public fountains, which are supplied by a fine aqueduct, supposed to have been constructed by the Romans. B. has a handsome cathedral; but its chief glory is its old castle, scene of many interesting historical events. Louis XII. was born in it, and under its roof Charles, Duc d'Alençon, and Margaret of Anjou, and Henry IV. and Margaret of Valois were married. Here also were sometimes held the courts of François I., Henry II., Charles IX., and Henry III. Here also the Duc de Guise and his brother were murdered, by order of Henri III., 1588, Dec. 23. Isabella, queen of Charles VI., here found a retreat; it served as a prison for Mary de' Medici; Catharine de' Medici died within its walls; and Maria Louisa here held her court in 1814, after Paris had capitulated. B. is a place of great antiquity. Stephen, who usurped the crown of England on the death of Henry I., was a son of one of the counts of B., by Adela, the daughter of William the Conqueror. B. is an archbishop's see, has a tribunal of commerce, a communal college, a public library of 20,000 vols., a botanic garden, etc. and manufactures of porcelain and gloves, with a trade in brandy, wine, and wood. Pop. (1891) 23,457; (1896) 23,542.

BLOMARY, **BLOOMARY**, or **BLOOMERY**, *blóm'a-rí* [A. Sax. *blóma*, a mass of metal]: a kind of furnace for reducing iron ore, in use from remote times and among rude peoples as well as those highly civilized. Diodorus Siculus describes such a process used in the island of Elba. The ruder forms are small open pits of clay or earth with openings in the side, tuyeres, for the passage of air-blast from

the bellows. The Catalan furnace, used in Spain and s. France, is an improved form; it has a hearth of heavy iron plates at the bottom of a pit 2 ft. or less in depth, 30 ft. long, 2½ ft. wide, or smaller. Ignited charcoal and broken ore are heaped up in this, more charcoal and fine ore being thrown on during the process, which lasts about six hours; then the *loup*, or mass of iron collected at the bottom, is taken out and freed from dross by forging it into a *bloom* of malleable iron.—The German B., used in n. Europe, is an iron pot or a box of iron plates, lined with fire-bricks, 1 to 2 ft. in diameter and in depth. The furnace is first heaped up with charcoal ignited, unmixed with ore; then the ore, previously made fine, is thrown on top, a small quantity at a time, producing a *loup* and a bloom as above. Early in the last c. the German B. was introduced into America, and is still used, especially in n. New York, in improved forms called the B. fire, the Jersey forge, the Champlain forge, or sometimes (improperly) the Catalan forge. The Rev. Jared Elliot, 1762, treated black sands from Killingworth, Conn., in a B., and the blooms were made into fine steel; for the discovery he received a medal from the London Soc. of Arts. Now the old cold blast is replaced by a hot blast, and various other improvements have been made. Still the richest ore must be used, and at best there is great waste, much iron being lost in the slag. One and a half to two tons of rich ore will reduce to one ton of bloom, two tons or more of charcoal being consumed in the process. The heat in the B. is usually not sufficient nor intended to fuse the metal; the ore is simply ‘reduced,’ and the metal collects without melting. The B. requires very small outlay for the plant, and produces a fine quality of metal. However, it has given place for the most part to the regular blast furnace.

The name B. is given also to a similar furnace for converting cast-iron into malleable iron.

BLOMFIELD, *blām'fēld*, CHARLES JAMES, Bishop of London: 1786–1857, Aug. 5; b. Bury St. Edmund's, Suffolk, where his father was school-master. Being well grounded by his father in the classics, B. went to Cambridge, where he took high honors. After he had filled several curacies, the Bp. of London appointed him his chaplain in recognition of his acknowledged philological and theological acquirements. Soon, he was called to the living of St. Botolph; in 1824, he was made Bp. of Chester; and in 1828, he was promoted to the see of London, on the translation of Bp. Howley to Canterbury. B's reputation for classical scholarship rests chiefly on his editions of *Callimachus* (Lond. 1815), and of several of the dramas of *Æschylus*. In connection with Rennel, he published the *Musæ Cantabrigienses*; and with Monk (1812), the *Posthumous Tracts of Porson*; and 1814, the *Adversaria Porsoni*. He published also *Lectures on the Acts of the Apostles*. B. was exceedingly active in the superintendence of his diocese, and was a prime mover in the agitation for the erection of new churches. Under his presidency, more churches were erected in London than under any bishop since the

Reformation. His conduct in regard to the controversies that latterly agitated his diocese was much animadverted on by both parties. Accused at one time of leaning to Puseyism, he yet proceeded against his clergy for ritualistic practices. See *Memoir* (new ed. 1864).

BLOMMAERT, *blom'márt*, PHILIP: 1809, Aug. 24—1871, Aug. 14; b. Ghent: Flemish author. In 1834 he published a volume of verse, characterized by much simplicity and earnestness, but so inartistic in form that it had little success. He rendered better service to literature and to the patriotic cause by the publication (1836-41) of *Theophilus*, an old Flemish poem of the 14th c., and of the *Oud-vlaemsche Gedichten* (Old Flemish Poems) of the 12th, 13th, and 14th c. Both works are enriched with glossaries and learned annotations. B. showed a predilection for middle-age literature generally, and translated the *Nibelungen* into Flemish iambs. His most important work is a History of the Belgians (Brussels, 1849), in which he attempts to show that the political destiny of the Low Countries has ever been identical with that of Germany, and that it is with the latter country, and not with France, she should seek to ally herself. B. also contributed extensively to several Belgian journals, especially to the *Messenger des Sciences Historiques*. He died at Ghent.

BLONDE, n. *blönd* [F. *blonde*, a fair woman—from *blond*, fair, of a light yellow, flaxen: Pol. *blady*, pale]: a woman having a fair complexion and light hair, opposed to *brunette*; a kind of silk lace. BLOND, a. *blönd*, fair; having a fair complexion.

BLONDEL, *blön-děł'*: celebrated French minstrel of the 12th c., the favorite of Richard the Lion-heart, King of England, whom he accompanied to Palestine. When Richard, on his return, was seized and imprisoned by Leopold, Duke of Austria, B. (according to the exquisitely romantic myth of an old chronicler) resolved to find out the place in which his master was confined. He wandered through Germany in disguise; and at length coming to the castle of Lowenstein, in Austria, he heard that it contained some illustrious captive. Feeling assured that this was no other than the king, he tried all means to get a sight of him, but to no purpose. He then placed himself opposite to the tower in which he learned the unknown was imprisoned, and commenced singing one of those Provençal songs which Richard and he had composed together. Hardly had B. finished the first stanza, when a well-known voice from the tower took up the second, and carried it on to the end. So the minstrel discovered his monarch, and was the means of his being ransomed by his subjects.

BLONDIN. *blön'dīn*, F. *blöng-däng'*, EMILE GRAVELLET: rope-walker: 1830—1897, Feb. 22; b. St. Omer, France. He became one of the greatest experts on the tight-rope. In 1855, he performed in New York, and four years later crossed the Niagara river, below the Falls, on a rope 1,300 feet long, 150 ft. above the water. He crossed also with a man on his back.

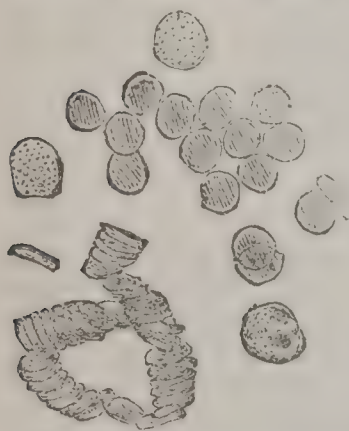
BLOOD.

BLOOD, n. *blūd* [AS *blod*; Dut. *bloed*; Ger *blut*, blood—as connected with Dut. *bloedsel*; OE. *blooth*; Ger. *blüthe*, a blossom, a flower, from their generally bright color: Ger. *blühen*, to glow—*lit.*, a fluid of a bright glowing color]: the red fluid which circulates through the veins and arteries of animals, essential to life; kindred; honorable birth or extraction: V. to stain with blood; to let blood; to bleed; to give a taste of blood, or to provoke the desire for it; to heat or exasperate. **BLOODING**, imp. **BLOOD'ED**, pp. **BLOOD'LESS**, a. *-lē's*, without blood; lifeless; inactive. **BLOOD'LESSLY**, ad. *-lē*. **BLOOD'Y**, a. *-ī*, stained with blood; cruel; murderous. **BLOOD'ILY**, ad. *-ī-lē*, with the disposition to shed blood; cruelly. **BLOOD'INESS**, n. state of being bloody; disposition to shed blood. **BLOOD BOUGHT**, a. purchased by shedding blood. **BLOOD-BROTHER**, n. a brother by blood, as contradistinguished from a brother-in-law, brought into that relation by marriage. **BLOOD GUILTINESS**, n. crime of shedding blood. **BLOOD HORSE**, one of a full or high breed; a thoroughbred horse. **BLOOD-HOT**, of the same heat as blood. **BLOOD-HOUND**, a hound for tracking human beings by scent; a hunter after human blood. **BLOODLETTER**, one who lets blood. **BLOODLETTING**, act of one who lets blood. **BLOOD ROOT**, a plant of the ord. *Hemodoriceæ*, so named from the red color of its roots, which are used in dyeing; also applied to a plant of the *Poppy* order, having a red juice. **BLOOD SHED**, n. waste of life. **BLOOD'SHEDDER**, n. one who. **BLOOD'SHEDDING**, n. act of shedding blood. **BLOOD SHOT**, a. red; inflamed. **BLOOD STAINED**, a. stained with blood; guilty of murder. **BLOODSTONE**, a variety of chalcedony of a dark-green color, sprinkled with deep red spots—also called *heliotrope*. **BLOOD-SPAVIN**, a distemper in horses, consisting of a soft swelling growing through the hoof, and usually full of blood. **BLOOD'SUCKER**, n. any animal that sucks blood, as a leech; a cruel man. **BLOOD THIRSTY**, a. cruel; murderous. **BLOOD-VESSEL**, a vein or artery. **BLOODY-FLUX**, the disease called *dysentery*, in which the discharges from the bowels have a mixture of blood. **BLOODY-SWEAT**, a sweat accompanied with a discharge of blood; a disease called the sweating sickness. **FLESH AND BLOOD**, human nature; mortal man. **COLD BLOOD**, free from excitement or passion. **COLD-BLOODED**, a. cool and calculating, used in a bad sense; not having warm blood. **HOT BLOOD**, in a state of excitement and blind fury. **HOT-BLOODED**, a. very impulsive; fiery. **PRINCE OF THE BLOOD**, one of royal descent. **BIT OF BLOOD**, a high or well-bred animal. **BLOODY-HAND**, symbol of a baronet. **BLOODY ASSIZES**, the assizes or court held in 1685 by the infamous Judge Jeffreys, by whose sentence some 300 were hanged, 1,000 sent to slavery in the colonies, and many whipped and imprisoned—all with a mere show of a trial. *Note.*—**Bloody**, this OE. word, and now only low vulgarity, in the sense of 'a bit; half; very much; excessive'—as 'bloody fool' = a bit of a fool; very much a fool—'bloody strange' = very strange; rather strange, is really a different word from that given in the text. It is not likely that writers such as Dean Swift and the poet

BLOOD

Gray would have written, 'It grows *bloody* cold,' 'a *bloody* satire,' if the present sense of a sanguinary character had been exclusively attached to it in Swift's time. Indeed, the alternative, innocent sense is very old. The etymology may be found in such a form as 'Gael. *bloide*, a piece'—see Dr. C. Mackay.

BLOOD: the nutritive fluid of the tissues, circulating through the veins and arteries of animals. It consists of a transparent colorless fluid, the *liquor sanguinis*, and minute solid bodies, the 'corpuscles' which float in it. The liquor sanguinis consists of water, in which are dissolved fibrine, albumen, chlorides of sodium and potassium, phosphates of soda, lime, and magnesia, together with fatty and extractive matters, the latter the product of the metamorphosis of the tissues.



Blood-corpuscles highly magnified.

The corpuscles are of two kinds—white and red; the white are larger and less numerous than the red, being in healthy blood in the proportion of 2 or 3 to 1,000. In certain forms of disease the number of these white blood-corpuscles is increased. They present a granular appearance on the surface, have a nucleus, which is speedily brought into view by the action of dilute acetic acid, and are identical with the lymph-corpuscle.

Under the microscope they vary their forms in the same way as the

Amœba (see PROTEUS); hence these movements are called *amœboid*. The *red* corpuscles are peculiar to vertebrates, and seem to have their origin in the white corpuscles, are oval and nucleated in fishes, reptiles, and birds, but in man and the mammalia generally they are non-nucleated, and are biconcave flattened discs, their edges being thicker than the centre, hence the dark appearance of the latter when seen under the microscope. They have a great tendency to turn on their side and run into rouleaux, like piles of coins. Their color is straw-yellow, and it is only when seen *en masse* that they give the blood its characteristic red color. The size of the human red blood-corpuscles is $\frac{1}{3200}$ of an inch. They are largest in reptiles, those of the Proteus (q.v.) being $\frac{1}{400}$ th of an inch in their long diameter. Hoppe Seylar has shown that, chemically, they consist chiefly of hemoglobine, with traces of albumen, cholesterine, protagon, phosphate of potash, but no fat. The specific gravity of B. is 1052 to 1057, and its *mean* quantity in an adult man about 34½ lbs. On evaporation as a whole, the B. yields 790 parts in 1,000 of water, and 210 of solid residue, which residue has nearly the same ultimate chemical composition as that of flesh. When B. is set aside for a time, occasionally crystals consisting of globuline tinted with coloring matter appear. 'The B. crystals of man and the carnivora have a prismatic form, whilst those of the rat and mouse are tetrahedral, and those of the squirrel hexagonal' (Carpenter).

BLOOD.

Coagulation of the Blood.—When B. is drawn from the vessels, the liquor sanguinis separates into two parts,—into fibrine, which becomes solid, and a pale yellowish colored liquid, *serum*. The fibrine coagulates, and in doing so entangles the corpuscles, and forms a red mass, the clot (*crassamentum*). Fibrine does not exist in the B. as such, but when it appears as a coagulum in a fluid, it is produced then and there by the union of two substances present in the blood, which separate as a solid matter (Schmidt)—the one, *globuline*, is contained in the blood-corpuscles; the other, *fibrinogen*, in the blood-plasma, the two uniting to form the fibre of the clot. The rapidity with which this change takes place varies with circumstances. Moderate heat, and exposure to the air, favor it; cold and exclusion from the air retard it. The B. remains fluid in the veins for some time after death. In glanders and some forms of malignant fever, and where the B. is *poor*, as in scurvy, it may remain fluid. The size and firmness of the clot depend on the amount of fibrine developed from fibrinogen in the B., which in health averages about two parts in 1,000. In inflammations it is much increased, and the B. forms slowly into a tough clot, almost destitute of red globules on its surface, and drawn in toward the centre. This colorless layer is termed the *buffy coat*, and the physicians of bygone times used to attach great importance to it, believing that it was a phenomenon peculiar to inflammation, and bled repeatedly, with the view to its removal; whereas anything which delays coagulation, great poverty of B., as in Chlorosis (q.v.), or any condition in which the fibrine is in greater proportion than the red blood globules, will cause this appearance; the clot of the impoverished blood will, however, be small and loose, and floating in an excessive quantity of serum. The color of the B. varies. In the arteries it is of a bright-scarlet color, while in the veins it is of a dark-purple color. The chief difference between arterial and venous blood is that the former contains more oxygen and less carbonic acid than the latter. See CIRCULATION OF THE BLOOD. This change probably arises from the oxygen contracting the corpuscles, and altering their reflecting surfaces; carbonic acid, on the other hand, rendering them thinner and more flaccid. The changes in color can be effected in B. drawn out of the body by the application of the gases mentioned.

The red blood-corpuscles possess great powers of absorbing oxygen. They receive oxygen in the lungs, where they become colored, and carry it all over the body to the tissues to form new combinations. After a time, the corpuscles become dissolved in the liquor sanguinis, which fluid they serve to elaborate. The products of the metamorphosis of the tissues are poured into the B., so that it is really a very complex fluid. See RESPIRATION.

BLOOD, AVENGER OF: one who anciently had the duty of pursuing and slaying a murderer. In the early ages of society, the infliction of the penalty of death for murder did not take place by the action of any tribunal or public authorities administering law, but in accordance with the

BLOOD.

rude social condition, was left to the nearest relative of the murdered. He was called the avenger of B., in Hebrew, *Goël*, which term, however, was of much wider signification. The Mosaic law (Num. xxxv.) did not set aside this universal institution of primitive society, but placed it under regulations, prohibiting the commutation of the penalty of death for money, which appears to have become frequent, and appointing *cities of refuge* for the manslayer who was not really a murderer: see CITY OF REFUGE. The Koran sanctions the avenging of B. by the nearest kinsman, but also sanctions the pecuniary commutation for murder. The primitive institution or custom subsists in full force among the Arabs at this day. Many of the hereditary feuds of families, clans, and tribes in all barbarous and semi-barbarous countries, have always been connected with the avenging of blood.

BLOOD, CORRUPTION OF, in Law: see TREASON.

BLOOD, EATING OF: an offense under the Mosaic law: prohibited obviously for reasons connected with the use of animals in sacrifice. Christians, with a few exceptions, have always regarded the prohibition as having ceased with the sacrifices which gave occasion for it; and the exhortation of the apostolic council of Jerusalem to the Gentile converts to abstain 'from things strangled and from blood,' has been almost universally viewed as merely an application of the great law of Christian charity to the circumstances of a transition period, with reference to the prejudices of Jewish converts.

BLOOD, THOMAS: abt. 1618-80; b. Ireland, where he served in the parliamentary army: daring and successful adventurer. After the Restoration, he put himself at the head of an insurrectionary plot, which was to begin with the seizure of Dublin Castle, and of Ormond, the lord-lieut. On its timely discovery, he fled, while his chief accomplices were seized and put to death. Escaping to Holland, he was received there with high consideration. He soon found his way back to England, to try what mischief might be brewed among the fifth-monarchy men. Finding no prospect of success, he went to Scotland, invited by the turbulent state of affairs, and was at the fight of Pentland, 1666, Nov. 27. On the night of 1670, Dec. 6, the Duke of Ormond was seized, in his coach in St. James's Street, London, by a gang of bravoës, tied on horseback behind one of them, and hurried away toward Tyburn. The timely approach of his attendants at the moment that he had succeeded in struggling with his riding-companion to the ground, probably saved him from hanging. The leader in this daring villainy was B., and so well had he contrived it, that he did not even incur suspicion. His next enterprise was still more wild and dangerous. On 1671, May 9, disguised as a clergyman, and with his former accomplices, he entered the Tower with the determination to carry off the regalia of England. After nearly murdering the keeper of the jewels, he actually succeeded in carrying off the crown under his cloak, while one of his associates bore away the

BLOOD-BIRD—BLOOD-HOUND.

orb. They were immediately pursued, however, seized, and committed to the Tower jail. Now came a singular turn of fortune. At the instigation of Buckingham, who was accused of having hired B to attack the Duke of Ormond, King Charles visited the dauntless miscreant in prison, and, dreading the threat that there were hundreds of B.'s associates banded together by oath to avenge the death of any of the fraternity, pardoned him, took him to court, gave him an estate of £500 a year, and raised him so high in favor that for several years Colonel B. was an influential medium of royal patronage. This scandalous disregard of public decency was heightened by the fact that the old jewel-keeper, who had risked his life in defense of his charge, applied in vain for payment of a small reward for his devotion. After the fall of the 'cabal' ministry, B. became hostile to Buckingham, and for a scandalous charge against him was committed to prison. He was bailed out, and died in his own house.

BLOOD BIRD of New South Wales (*Myzomela sanguinolenta*): beautiful little species of Honey-eater (q.v.), which receives its name from the rich scarlet color of the head, neck, breast, and back of the male. It inhabits thickets. A very similar species is found in Bengal.

BLOOD-BOLTERED, a. *blūd-bōlt'erd* [OF. *bloutre*, a clod: Sw. *plotter*, a small portion: Dan. *bultred*, rugged]: in OE., matted or clotted with blood. *Note.*—*Boltered* is connected with *ball*, as the snow *balling* in horses' feet, that is, forming into lumps or small *balls*. The OE. *baltered*, from *ball*, is apparently the older form.

BLOOD-FLOWER (*Ixemanthus*): genus of bulbous-rooted plants of nat. ord. *Amaryllidaceæ* (q.v.), mostly natives of s. Africa, some of which are among the prized ornaments of green-houses. They take their name from the usual color of their flowers, which form a fine head or cluster, arising from a spathe of a number of leaves. The fruit is a berry, usually with three seeds. The leaves of the different species show considerable diversity of form, in some almost linear, in others almost round; in some also they are erect, in others, appressed to the ground. The bulbs of some of the finest species of B. being very slow to produce offshoots, a curious method of propagating them is resorted to by gardeners, which is occasionally practiced also with other bulbous-rooted plants, by cutting them across above the middle, upon which a number of young bulbs form around the outer edge.

The species of B. seem generally to possess poisonous properties. The inspissated juice of *H. toxicarius* is used by the natives of s. Africa for poisoning their arrows.

BLOOD'-HOUND: a variety of hound (q.v.) remarkable for its exquisite scent and for its great sagacity and perseverance in tracking any object to the pursuit of which it has been trained. It derives its name from its original common employment in the chase, either to track a wounded animal or to discover the lair of a beast of prey. It was also formerly called, both in England and Scotland, *sleut-*

BLOOD-HOUND.



Many-flowered Blood-flower:

a, leaves and fruit of flower-stem, in miniature; *b*, flower;
c, seed-bud, shaft, and summit; *d*, seed-bud cut transversely.

hound or *sleuth-hound*, from the Saxon *sleut*, the track of a deer. The B. was formerly common and much in use in Britain as well as on the continent of Europe, but is now rare. The poetical histories of Bruce and Wallace describe these heroes as occasionally tracked by blood-hounds, when they were skulking from their enemies. The B. was at a later period much used to guide in the pursuit of cattle carried off in Border raids; it has been frequently used for the pursuit of felons and of deer-stealers; and formerly, in the United States, for the capture of fugitive slaves, an employment which has tended to render its name odious. Terrible ideas are also, probably, suggested by the name itself, although the B. is by no means a particularly ferocious dog, and when employed in the pursuit of human beings, can be trained to detain them as prisoners without offering to injure them. The true B. is taller and also stronger in proportion, and of more compact figure, than a fox-hound, muscular and broad-chested, with large pendulous ears, large pendulous upper lips, and an expression of face variously described as 'thoughtful,' 'noble,' and 'stern.' The original color is said to have been a deep tan, clouded with black. The color appears to have been one of the

chief distinctions between the B. and the Talbot (q.v.), but it is not improbable that this name was originally common to all blood-hounds. Many interesting anecdotes are recorded of the perseverance and success of blood-hounds in following a track upon which they have been set, even when it has led them through much-frequented roads.—The CUBAN B., much employed in the pursuit of felons and of fugitive slaves in Cuba, differs considerably from the true B.



Bloodhound.

of Europe, being more fierce and having more resemblance to the bull-dog, and probably a connection with that or some similar race. Many of these dogs were imported into Jamaica, 1796, to be employed in suppressing the Maroon (q.v.) insurrection, but the terror of their arrival sufficed without their actual employment. It was this kind of B. chiefly which was introduced into the former slave-states.

BLOOD-LETTING: see BLEEDING.

BLOOD-MONEY: in English Law, formerly, money obtained by informers against great criminals for supporting a capital charge; now applied to reward earned by one who exposes his accomplices in crime, or in general to any act of treachery.

BLOOD-MONEY, in pagan times and nations, the compensation paid by one who killed a man to the next of kin of the man slain, whereby the slayer and his kindred were secured from retaliation. Often the amount was fixed by law. The Arabs still have this custom.

BLOOD OF OUR SAVIOR: order of knighthood in Mantua, instituted by Duke Vincent Gonçaga 1608, on the occasion of the marriage of his son with a daughter of the Duke of Savoy. It consisted of 20 knights, the Mantuan dukes being sovereigns. The collar had threads of gold laid on fire, and interwoven with the words *Domine probasti*. The name originated in the belief that among the relics shown in St. Andrew's Church, Mantua, are some drops of Christ's blood.

BLOOD OF ST. JANUARIUS: see JANUARIUS, ST.

BLOOD-POISONING: see PYÆMIA: SEPTICÆMIA.

BLOOD-RAIN—BLOOD-STAINS.

BLOOD-RAIN: reddish and grayish dust, accompanied with moisture, sometimes falling in showers off the coast of Africa and on the land in the s. of Europe, in elevated regions falling as red snow. Such dust falls also without moisture. It consists mainly of microscopic organisms, mostly diatoms and rhizopods of more than 300 species, 15 being S. American, none African; 49 species were furnished by a single shower in Italy, 1803; 64 species by another in Calabria, 1813; 28 species being the same in both. The red color comes from oxide of iron. A shower at Lyon, 1846, Oct. 17, deposited some 360 tons of matter, so estimated, one-eighth being organic. Darwin describes a shower covering over 1,000,000 sq. m. Like phenomena have appeared since Homer's time. Their origin is evidently not extra-terrestrial. The zone having such showers extends on both sides of the Mediterranean, over the Atlantic, e. to central Asia.

BLOOD-RAIN is also a name given to a fermentation fungus, *Palmella prodigiosa*, producing red patches on dressed vegetables, bread, etc.

BLOOD-ROOT: see **GEUM: HÆMODORACEÆ: SANGUINARIA.**

BLOOD-STAINS, in Criminal Law: as bearing on the charge of murder. In many cases they can be scientifically detected and distinguished from other stains. The methods employed are (a) microscopical, (b) chemical, (c) spectro-analytical.

(a) The test by microscope distinguishes: (1) B.-S. from other stains; (2) blood of mammals, including man, from that of birds, fishes, and reptiles; (3) human blood from that of other mammals.

(1) With a microscope of low power, 20 to 30 diameters, in strong light, a dry B.-S. on a fibrous article appears glossy, dried coagulum being on each fibre or in the meshes between the fibres, in certain lights appearing dark-red, in other lights bright crimson. Stains from other substances have no such appearance. From such an examination an expert can generally form an opinion, even if the stain be very small. Also, properly treated, a blood solution forms *hematine* crystals distinguishable under the microscope, but this method is unsatisfactory. With a microscope of power of 300 to 500 diameters, if a particle of the coagulum slightly diluted, if not too old, be placed on a slide, blood corpuscles are recognized, showing that the stain is made by some kind of blood. (2) With a microscope of a power of 500 diameters the blood of mammals, if fresh enough, is distinguishable from that of birds, fishes, and reptiles, by the round shape of the corpuscles of the former contrasted with the oval of the latter, and also by a difference of behavior under the guaiacum test noticed below. (3) With a microscope of a power of from 1,200 to 1,800 diameters, using a micrometer, human blood corpuscles can be distinguished, by difference of size, from the blood corpuscles of other mammals, except perhaps of the mouse, dog, cow, ass, hare, rabbit; the B.-S., however, must not have become dry.

(b) Chemical tests employ: (1) water, (2) boiling, (3) ammonia, (4) tincture of guaiacum and ethereal solution of

BLOODSTONE—BLOOM.

peroxide of hydrogen. (1) If insoluble in water, the stain is not blood. (2) If soluble, boil the solution. If a blood, it coagulates, loses its reddish color, and deposits a muddy, brown flocculent precipitate. No other red coloring matter is thus destroyed. (3) Taking the unboiled solution, add a few drops of weak aqua ammonia: if of blood, the red color is not changed. Other coloring matters are changed. —Add strong aqua ammonia; if of blood, the solution acquires a brownish tint. (4) A water solution of the red coloring matter of blood, when fresh tincture of guaiacum is added, causes a reddish-white precipitate of the resin: add to this precipitate an ethereal solution of peroxide of hydrogen, in a few seconds a beautiful blue is developed. No other red coloring matter shows these phenomena.

(c) A blood solution gives by spectrum analysis certain unmistakable lines in the spectrum.

The tests by microscope are always reliable, but can be used most successfully on recent stains. Chemical and spectro-analytical tests are reliable and are efficient for stains many years old, sometimes even when the articles stained have been well washed; they do not, however, distinguish between blood of different animals.—B.-S. on wall-paper and elsewhere can often be found by candle-light, though not seen by daylight.—Expert scientific testimony as to the nature of stains has had great weight in many criminal trials. (See Taylor's *Medical Jurisprudence*, ed. by Reese, Phila. 1880.)

BLOODSTONE: see **HELIOTROPE**.

BLOOM, n. *blóm* [Icel. *blómi*; Dut. *bloeme*; Ger. *blume*, a flower (see **BLOW**)]: blossom; the flower of any plant; the bright color of the cheeks; the beginning of youth or manhood; life; vigor; beauty; bright or blue color on fruit, as on the peach or grape; a clouded appearance which varnish sometimes assumes upon the surface of a picture; a whitish waxy secretion produced on the surface of some leaves and fruits: V. to put forth blossoms; to flower; to be in a state of vigor; to have the freshness and beauty of early life. **BLOOMING**, imp.: ADJ. putting forth blossoms; healthy; fresh-colored. **BLOOMED**, pp. *blómd*. **BLOOMINGLY**, ad. *-lī*. **BLOOM'INGNESS**, n. **BLOOM'Y**, a. *-ī*, full of bloom.

BLOOM, n. *blóm* [AS. *bloma*, a mass, a lump]: the rough mass of iron from the puddling-furnace after undergoing the first hammering. **BLOOM'ARY** or **-ERY**, n. *-er-ī*, the furnace in which cast is converted into malleable iron. **BLOOM'ING**, n. the process of converting cast into malleable iron.

BLOOM: an appearance on paintings resembling in some measure the bloom on certain kinds of fruit, such as peaches, plums, etc. (hence the name), produced, in all probability, by the presence of moisture in the varnish, or on the surface of the painting when the varnish is laid on. The B. destroys the transparency, and is consequently very injurious to the general effect of a picture. It is best prevented by carefully drying the picture and heating the varnish before applying it; and best removed by a sponge dipped in

BLOOMARY—BLOOMFIELD.

hot camphine, after which a soft brush should be employed to smooth the surface of the picture, which should be finally placed in the sunshine to dry.

BLOOMARY: see BLOMARY.

BLOOMERISM: a new and fanciful fashion of women's dress, partly resembling male attire, which arose out of what is termed the 'Woman's Rights' Movement,' that began in the United States about 1848. The claim was that women should take their place in the world as fellow-workers with men, and ought not to be under the disadvantage of having a dress that hampered their movements, requiring much muscular power for its support. In 1849, Amelia (Jenks) Bloomer, of Seneca Falls, N. Y. (b. 1818), adopted the costume, and lectured in various places on its advantages. The bloomer dress consisted of a jacket with close sleeves, a skirt falling a little below the knee, and a pair of Turkish trousers. Though a few ladies followed the example of Mrs. Bloomer, the dress was extremely unpopular, and exposed its adherents to a degree of social martyrdom which the more prudent, timid, or amiable declined to brave. A very elegant modification of the Bloomer dress was achieved by a New York lady—a Polish jacket, trimmed with fur, and a skirt reaching to within a few inches of the ground, and showing off merely the trim furred boot, but still sufficiently short to avoid contact with the dirt of the street. In England, B. failed to gain entrance into respectable society, and speedily disappeared. Still, the desire for dress-reform has not died out on either side of the Atlantic. It is felt that the changing fashions, always imperious, are liable to be sometimes inconvenient and unhealthful, sometimes dirty, and often ridiculous; but the prejudice with which any innovation is sure to be met greatly discourages every attempt to introduce a reform.

BLOOMFIELD: town in Essex co., N. J.; 4 m. n.n.w. from Newark, 12 m. n.w. of New York; on Morris canal, Montclair and Greenwood Lake R. R., Newark and Bloomfield R. R., and connected with Newark by trolley. It has five churches, a Presb. theol. seminary for the education of German ministers, one weekly newspaper, a savings-bank, and manufactures of organs, woolen goods, etc.; B. is the residence of many business men of New York and Newark; it was one of the earliest settlements in the state, and named from Gen. Joseph Bloomfield, a revolutionary officer, member of congress, and gov. of New Jersey. Pop. (1880) 5,748; (1890) 7,708; (1900) 9,668.

BLOOMFIELD, ROBERT: 1766-1823: b. Honington, near Bury St. Edmund's: son of a poor tailor, who died, leaving Robert an infant. His mother with difficulty subsisted by teaching a school, where B. learned to read. At the age of 11 he was hired to a farmer, but ultimately became a shoemaker in London, where, in a poor garret, he wrote his *Farmer's Boy*, published 1800. It had extraordinary popularity, and was translated into a number of languages. He subsequently published *Rural Tales*, *Wild Flowers*, and other pieces. Though efforts were made for him by per-

BLOOMFIELD—BLOT.

sons of rank, his health broke down, and he died nearly insane, at Shefford, Bedfordshire.

BLOOMFIELD, SAMUEL THOMAS, D.D.: 1790-1869: clergyman of the Church of England: graduate of Cambridge; rector at Bisbrooke, Rutland; translator of Thucydides' *Peloponnesian War*; author of many annotations to the New Testament, and of English notes to the New Testament in Greek—the latter much used in England and America.

BLOOMINGTON: prosperous city of central Ill., co. seat of McLean co., 59 m. n.e. of Springfield, 126 m. s.s.w. of Chicago; on n. div. Chicago and Alton R. R., n. div. Illinois Central R. R., Indianapolis Bloomington and Western R. R., and w. terminus of Bloomington div. of Wabash R. R.—thus an important railroad centre. It has court-house of Illinois marble, costing \$100,000, 15 churches, the Major College for women, a Rom. Cath. academy, a high school, an opera house, 5 banks, the Chicago and Alton R. R. machine shops, employing nearly 1,000 men, various mills and factories, also coal-mines. B. has two daily, five weekly newspapers, one being in German; has gas supply, and water-works deriving water in abundance from a well in the prairie, and using a stand-pipe 204 ft. high; is also the seat of the Ill. Wesleyan Univ. (Meth. Episc.), having over 500 students in 1885. The Ill. State Normal Univ. is a large and flourishing institution at Normal, 2 m. n. of B. See **NORMAL**. Pop. (1870) 14,590; (1880) 17,184; (1890) 20,484; (1900) 23,286.

BLOOMINGTON: city of Indiana, co. seat of Monroe co., 60 m. s.s.w. of Indianapolis; on Louisville New Albany and Chicago R. R.; between branches of White river. It has a court house, nine churches, a national bank, two weekly newspapers, a foundry, limestone quarries, manufactures of woolen goods, staves, etc. Indiana Univ. is here, with buildings and apparatus worth \$200,000, 12 endowed professorships, and state support. Pop. (1890) 4,018; (1900) 6,460.

BLOOMSBURG: borough of Penn., seat of Columbia co.; 56 m. w.s.w. of Scranton, 80 m. by railroad, n.e. of Harrisburg; on Fishing creek, one m. n. of the n. branch of the Susquehanna river, on Lackawanna and Bloomsburg R. R., and a canal connected with the Susquehanna river. It has 10 churches, a national bank, two other banks, good hotels, iron furnaces, four foundries, and three weekly newspapers. B. state normal school has partial state support and buildings, etc., \$150,000 in value. Pop. (1890) 4,635; (1900) 6,170.

BLOSSOM, n. *blōs'sŭm* [AS. *blostma*, and *blosma*; Dan. *blusse*, to blaze: Dut. *blosem*, a blossom: L. *flos* or *florem*, a flower]: the flower of any plant, especially when it precedes fruit: V. to put forth flowers before the fruit begins to grow. **BLOSOMING**, imp.: N. the flowering of plants. **BLOSOMED**, pp. *-sŭmd*. **BLOSOMY**, a. *-sŭm-ĭ*, full of blossoms. **BLOSOMLESS**, a.

BLOT, v. *blōt* [Dan. *plet*, a stain; *blat*, a portion of any

BLOT—BLOW.

Being wet: Icel. *blettr*, a spot, a stain: Fris. *blat*, bare: Scot. *blad*, a lump of anything soft]. to wet or discolor a part; to spot or stain with ink or any other coloring matter; to destroy; to efface; to defame: N. a spot or stain; a blemish. **BLOT'TING**, imp. **BLOT'TED**, pp. **BLOT'TER**, n. one who or that which. **BLOTTING-PAPER**, a soft unsized paper used for drying freshly-written paper by imbibing a portion of the ink. **BLOTTY**, a. *blöt tī*, full of blots.—**SYN.** of 'blot, v.': to expunge; rase; erase; efface; cancel; obliterate; disgrace; tarnish;—of 'blot, n.': stain; blemish; flaw; defect; speck; fault; blur.

BLOT, n. *blöt* [Sw. *blott*; Dan. *blot*; Dut. *bloot*, naked, exposed]: at *backgammon*, a piece so left as to make it liable to be taken.

BLOTCH, n. *blöch* [Ger. *plotz*, a blow or the sound of it; *blätz*, a spot or blot: Ger. *platschen*, to splash; *platsch*, a splash: connected with **BLOT** 1, which see]: a scab or eruption on the skin: V. to blacken or spot. **BLOTCH'ING**, imp. **BLOTCHED**, pp. *blöcht*: **ADJ.** irregularly disposed in broad patches. **BLOTCH'Y**, a. -*ī*, full of blotches.

BLOTE, v. *blöt* [Sw. *blota*, to soak, to steep (see **BLOAT**)]: to dry by smoke, as fish. **BLO'TER**: see **BLOATER**.

BLOUNT, *blünt*, JAMES HENRY: 1837, Sept. 12—1903, Mar. 8; b. Macon, Ga. He was elected to congress from Ga. as a democrat 1872, and re-elected until 1892, when he declined renomination. He was appointed by Pres. Cleveland 1893, Mar. 13, his special 'paramount' commissioner to the Hawaiian Islands, with reference to the revolution there which had placed Hawaii under the protection of the U. S. flag, with a view to annexation. Soon after his arrival, B. ended the protectorate and ordered the Amer. flag hauled down. This commission evoked sharp criticism. In May, B. was appointed U. S. minister to Hawaii, and soon afterward resigned.

BLOUSE, *blous* [F. *blouse*; mid. L. *blialdus*; Pers. *bal'yād*, a plain garment]: loose sack-like over-garment. The coat worn by officers and soldiers of the U. S. army and militia, except on occasions of ceremony, is so called. The B. worn by English wagoners etc., is called a smock frock.

BLOW, n. *blō* [Dut. *blaeuwen*, to strike; *blaeuw*, blue, livid: OF. *blau*, a bruise, a blow: Gr. *plegē*; L. *plaga*, a blow, a stroke—*lit.*, a livid mark left by a stroke]: a stroke; first act of hostility; a sudden calamity. **COME TO BLOWS**, to quarrel; to engage in battle. **A BLOW-OUT**, in *slang*, a holiday; a good and plentiful meal; a drunken frolic. **AT A BLOW**, at one effort; suddenly; at a single act, as, he lost all at a blow.

BLOW, v. *blō* [AS. *blawan*, to blow or breathe: Ger. *blähen*, to puff up: Gael. *blagh*, to blow, as the wind]: to puff up or inflate; to move as air; to pant or puff; to throw or drive a current of air into or upon; to warm or cool by the breath; to sound a wind instrument; to deposit eggs, as flies. **BLOW'ING**, imp. **BLEW**, pt. *blō*. **BLOWN**, pp. *blōn*: **ADJ.** swollen; puffed up; quite out of breath. **BLOW'ER**

BLOW—BLOW-FLY.

n. one who. **BLOWY**, a. *blō'z*, windy. **BLOW-PIPE**, n. *-pīp*, a tube through which a current of air is driven on a flame to obtain an increased heat. **BLOW-OFF PIPE**, in a *steam-engine*, the pipe fixed to the bottom of a boiler for discharging the sediment. **BLOW'ERS**, n. plu. *-erz*, in *coal-mining*, the puffs or jets of carburetted hydrogen given off by fissures in the coal. **BLOW-BALL**, the downy head of the dandelion. **BLOW-FLY**, the carrion-fly, which deposits its eggs on flesh-meat. **To BLOW OFF**, to permit to escape, as steam. **To BLOW OVER**, to pass away. **To BLOW UP**, to drive up into the air, as by gunpowder; to raise or swell with the breath; to give a scolding to. **To BLOW OUT**, to extinguish by the wind or by the breath. **BLOWING-HOUSE**, the blast-furnace in which tin ore is fused. **BLOWN UPON**, made stale or disreputable; tainted; discredited; discovered; exposed. **To BLOW HOT AND COLD**, to appear as both favoring and opposing; to be inconsistent.

BLOW, v. *blō* [AS. *blowian*, to bloom: Ger. *blühen*, to bloom or blossom: Gael. *blàth*, bloom, flowers—*lit.*, to shine with bright colors]: to come into flower; to show flower. **BLOW'ING**, imp. **BLOWN**, pp. *blōn*.

BLOW'-FLY (*Sarcophaga carnaria*): insect of the order *Diptera* (two-winged), (q.v.) and of the large family *Muscides*, of which the common House-fly (q.v.), Flesh-fly (q.v.), etc., are familiar examples. The B. is very similar to these in its general appearance; its body is hairy, the expanse of its wings about one inch, the face silky and yellow, the thorax gray, with three black stripes, the abdomen of a shining blackish brown, which, in certain



Blow-fly and Pupa.

points of view, assumes a bluish tint, checkered with glittering yellowish spots. One of the distinguishing characters of the genus is, that the eyes are widely separate in both sexes. The species of this genus are not unfrequently ovoviviparous, the eggs being hatched within the body of the parent. The generic name [Gr. *sarx*, flesh; *phago*, to eat] is derived from the fact that the larvæ of most of the species feed upon the flesh either of dead or of living animals. The B. has a wide range through many countries, particularly in some marshy districts; and its larvæ are to be found feeding upon meat, the carcasses of animals, sometimes upon living earthworms, and frequently upon sheep, of which it is one of the most grievous pests, requiring the constant attention of the shepherd during

BLOWING-MACHINES.

most of the summer and autumn. Unless the maggots are removed, they eat into the skin, the sheep suffer great torment, and soon die. At first they may be removed by shaking them out of the wool, into which dry sand is then abundantly sprinkled; but if they are very numerous, a mercurial ointment or wash of corrosive sublimate is applied; and when the skin is much broken, the wool is clipped away, an ointment of tar and grease is used, and a cloth sewed over the part. Like many other insects, the *B.* multiplies with excessive rapidity.

Another species of this genus is *S. mortuorum*, so named from its frequenting burial-vaults and similar places. It is very similar to the *B.*, but the abdomen is of a shining steel-blue, and there is a reddish-brown line down the forehead.

BLOWING-MACHINES: apparatus for making and directing a blast of air. The earliest blowing-machine was, doubtless, some form of the common bellows, the idea of which is supposed to have been derived from the lungs. A very primitive form of this instrument is still in use in some eastern countries, consisting simply of the skin of some animal sewed into a rude bag with a valve and nozzle. The older forms of domestic bellows all are on the same principle—viz., a chamber formed of two boards with flexible leather sides, having at one end a

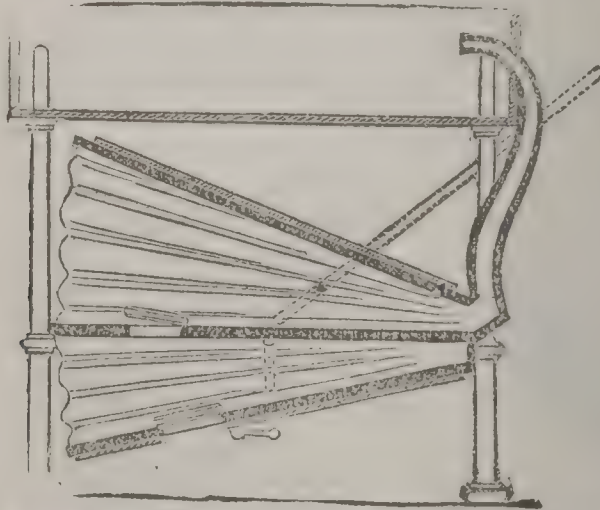


Fig. 1.—Section of Double-bellows for a Portable Forge.

nozzle with a narrow mouth; and in the lower board, a valve of considerably larger area for the admission of air. When the bellows are distended by drawing the boards apart, air is sucked in by the valve, to replace the vacuum which would otherwise be formed; and then, when the boards are being closed, the valve, which only opens inward is shut by the compressed air; and the latter, having no other escape, is forced out at the nozzle.

The great fault of the common bellows is, that it gives a succession of puffs, and not the continuous blast needed in certain operations. One remedy for this was to use two bellows, so that one was blowing while the other was filling; but it was afterward found that the double-bellows secured a still more uniform blast. This machine, shown

in fig. 1, is merely the common bellows with a third board of the same shape as the other two placed between them, so as to form two chambers instead of one. The middle board is fixed, and both it and the lower one have valves placed in them opening inward. A weight on the lower board keeps the under chamber filled with air; and when this board is raised by a lever or otherwise, the air which it contains is forced into the upper chamber. The exit-pipe is attached to the latter, and a weight is placed on the upper board sufficiently heavy to press the air out in a continuous stream, the continuity being maintained by the large quantity of air always present in the upper chamber, and the uniform pressure of the weight. Sometimes a spring is used instead of a weight to press out the air. Even with the double-bellows, however, the constant re-filling of the upper portion from the lower prevents the blast from being quite regular.

For such purposes as the supplying of a continuous stream of air to a flame for glass-blowing or soldering, a very convenient apparatus has been constructed by P. Stevenson of Edinburgh, which the diagrams (figs. 2 and 3) will explain. By means of the common bellows

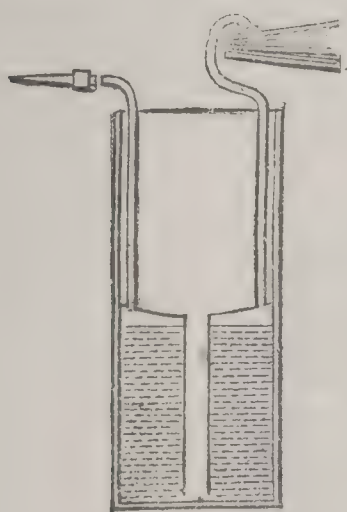


Fig. 2.

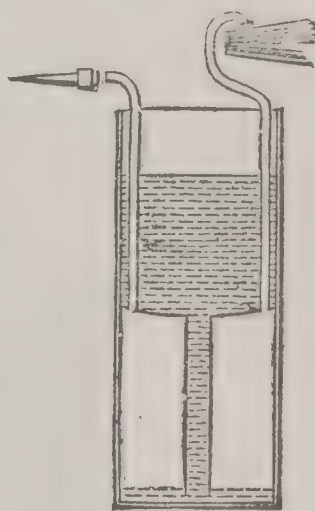


Fig. 3.

worked by a treadle, air is blown into the lower portion of a small cylinder containing a quantity of water, and having a diaphragm in the middle of the height, with a wide pipe reaching nearly to the bottom. When the apparatus is at rest, the water remains below the diaphragm, as shown in fig. 2; but when air is blown in, it gradually rises through the pipe to the position shown in fig. 3. The water as it descends then presses out the air in a steady stream by the exit-pipe, as a valve prevents it returning to the bellows.

Bellows made entirely of wood except the nozzle, first made in Germany in the 16th c., are in use in some countries of continental Europe. They are usually of large size, and the contrivance consists in having two boxes, of which the sides of the upper inclose those of the lower, so that the former can move up and down on the latter with-

BLOWING-MACHINES.

out admitting air except by a valve, as in the common bellows, of which, in fact, they are only a modification.

The Chinese have a very simple form of bellows, shown in fig. 4, which is not only interesting in itself, but also



Fig. 4.—Chinese Bellows.

because its action is almost the same as the blowing-engine. It is merely a square chamber of wood, with a close-fitting piston, which, when drawn from the nozzle, opens the valves *v, v*, to admit air, and when pushed in the opposite direction, shuts these valves, and forces the air out by the nozzle.

For blowing a domestic fire in a chimney, the most effective contrivance is a metal screen to close the front of the aperture above the grate, so that the supply of air must all pass through the fire. This kind of blower, however, will act only when the fire is already producing as much heat as to cause a sensible draught up the chimney.

For smelting and refining furnaces, where a blast with a pressure of 3 or 4 lbs. per square inch is required, blowing engines of large size, run at low speed, were formerly employed: see IRON (fig. 1). A form often preferred consisted of a steam-engine, with the ordinary steam cylinder at one end, and a blast cylinder at

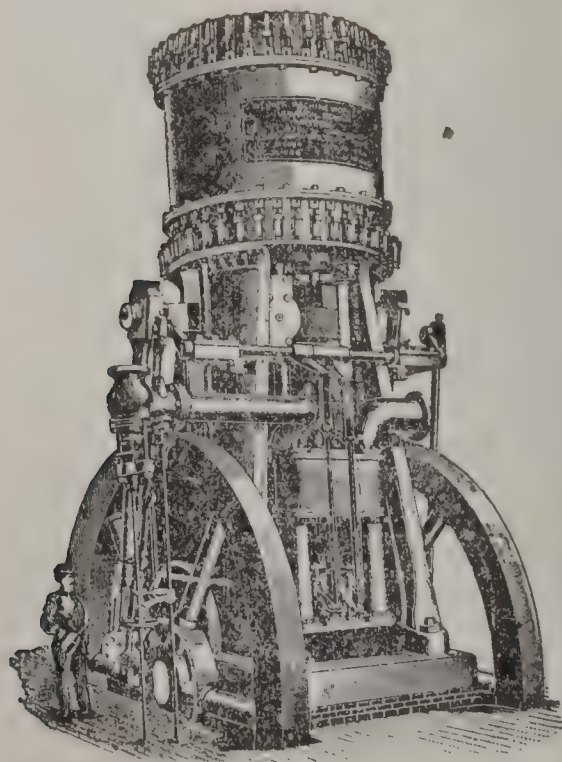


Fig. 5. Positive Motion Blower for Anthracite Furnaces.

the other end of the beam. Sometimes a horizontal arrangement was adopted for smaller engines. For the

BLOWING MACHINES.

valves large flaps of leather were used, backed with metal or wood. About 1876 the direct-acting vertical form with smaller valves and much higher speed—the blowing cylinder usually above the steam cylinder—began to come into use, and has now displaced the previous form. A blowing-engine of this style, from the Weimer machine-works, Lebanon, Penn., is shown in fig. 5. The valves—of sheet rubber, perforated with slots, and resting on iron seats in which are alternating slots, and lifting against iron guards whose slots correspond to the valve-slots—work with equal ease on any plane; hence they may be so set as

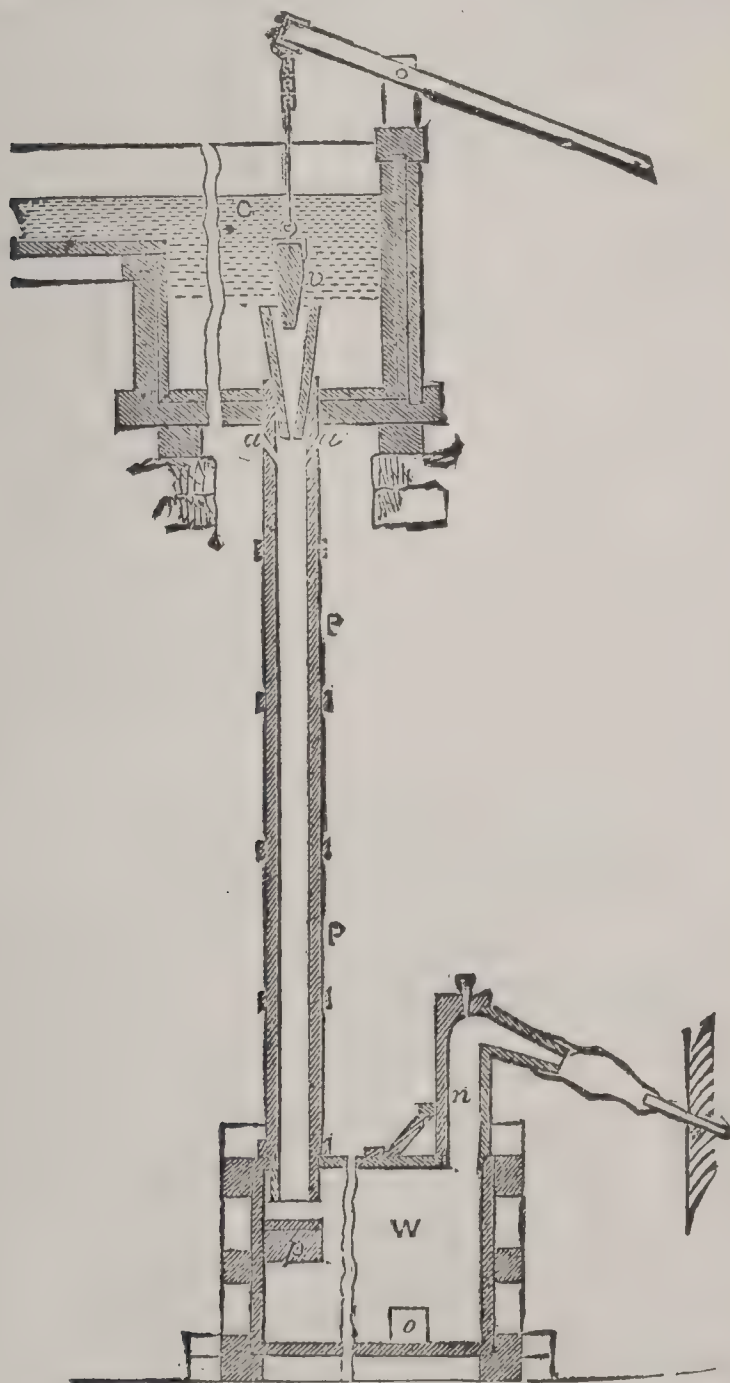


Fig. 6.—Trompe, or Water-blogging Machine (vertical section).

to provide the maximum area of opening. The blowing cylinder-heads accommodate the inlet valves, while the outlet valves are in the periphery of the cylinder. In this form of engine, the differing pressure on the air piston

BLOWING MACHINES.

and on the steam piston during a stroke causes fluctuations of energy, which necessitate two large and massive fly-wheels for an alternate balancing of the fluctuations by receiving, retaining, and dispensing the energy, each in its turn.

Fig. 5 shows a blowing-engine of positive motion, steam-valve gear, for anthracite furnaces: steam cylinder diameter 42 in., blowing cylinder diameter 84 in., revolutions per minute 20-60, minimum air-discharge per minute 6,140 cu. ft., maximum air-discharge 18,420 cu. ft., air-pressure 3-14 lbs. per sq. in.; at working-speed (revolutions per minute 50), air-discharge 15,350 cubic feet.

In the Catalan forges of Spain and the south of France, there is a very ingenious water-blowing machine in use called a *Trompe*; but it can be advantageously employed only where a fall of a few yards of water is available. Its construction will be understood by an inspection of Fig. 6. A strong wooden cistern, C, to act as a reservoir for the water; wooden pipes, P (generally two in number), through which it descends; and a wind-chest, W, to allow the air and water to separate, constitute the essential parts of the apparatus. It is put in operation by lifting the wedge *v* with a lever; this allows the water to rush down the pipe, and in doing so it draws air through sloping holes, *a, a*, called aspirators, at the throat of the pipe. A continuous current of water and air is thus supplied to the wind-chest, which is provided with an opening at *o* for the escape of the water, while the air passes out in a regular stream by the nozzle-pipe at *n*. The height from which the water falls determines the tension of the blast; but the height seldom exceeds 27 ft., which gives a pressure of from $1\frac{1}{2}$ to 2 lbs. to the sq. inch. It is asserted that no other blowing-machine gives so equable a blast as the *trompe*, and it is the least costly of any; but it has the serious defect of supplying air more or less saturated with moisture. The theory of this singular machine has never been satisfactorily explained, although one or two able philosophers, who have specially studied the matter, incline to the belief that much of the air is carried down the pipe by becoming entangled in water. It is found that the separation of the air from the water is greatly promoted by allowing the falling current to impinge on a narrow platform at *p*.

The fan, or Fanners (q.v.), has long been in use as a winnowing machine for agricultural purposes, for creating a blast to melt pig-iron in foundries, instead of bellows in smithies, as yielding a steadier blast, and for ventilation of buildings, ships, and mines: see VENTILATION. In construction, the fan is like a wheel, having the arms tipped with vanes instead of being joined by a rim. It is placed inside a chest—usually in an eccentric position—with openings on each side round the spindle for the admission of air. The motion is given by steam or other power; and as it revolves the centrifugal action sucks in

BLOWING MACHINES.

air at the centre, draws it toward the tips of the vanes, and these impel it forward through the exit-pipe. Fig. 7 represents a vertical section and fig. 8, a plan of a

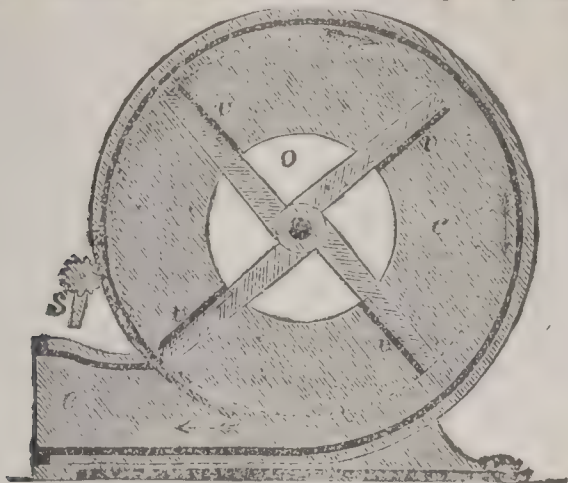


Fig. 7.—Fan (vertical section).

blowing-fan, in which *v, v, v, v* are the four vanes; *o*, one of the central openings; *c*, the chest or fan-case; and *e*, the exit-pipe. Engineers differ as to the proportions which should be adopted for the fan, and as to the extent of spiral which the fan-case should have. For foundries and smithies, where the pressure of the blast required is from four to five ounces per sq. inch, the following have been found to suit very well in practice: the width of the vanes, as well as their length, made one-fourth of the diameter of the fan; the inlet openings in the sides of the fan-chest one-half, and the degree of eccentricity, one-tenth, of this diameter. There is a segmental slide shown at *s* in fig. 7, by which the opening into the delivery-pipe may be increased or diminished. For

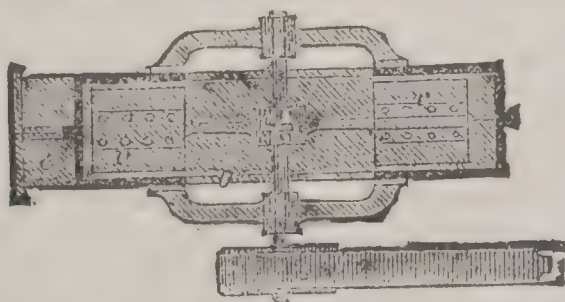


Fig. 8.—Fan (horizontal section).

are constructed of iron. In double fans, two simple fans are so disposed on one spindle that the blast produced by one passes in its compressed state through a tube to the other, which largely augments the working pressure. There are various forms. A modified form of the fan, called a *centrifugal disc*, has been used in London by the Pneumatic Dispatch Company for transmission of mail-bags. An ingenious but simple ventilator is in use in the mines of the Harz for supplying fresh air. It consists of two long cylindrical vessels, one of which is so much smaller as, when inverted, to move up and down inside the other. The outer one is partly filled with water, and has a tube leading through the water down to the

BLOW-PIPE.

mine. The inner inverted cask, which has a valve opening inward, is lifted and then pressed down, so forcing air through the tube.

The Messrs. Roots' blowing-machine is thus described: 'A pair of horizontal shafts, geared together at both ends, traverse a case of the form of two semi-cylinders, separated by a rectangle equal in depth to the diameter of the semi-cylinders, and in width to the distance between the centres of the shafts. . . . These shafts carry a pair of solid arms, each having a section somewhat resembling a figure of eight, the action of which, as they revolve, takes the air in by an aperture at the bottom of the machine, and expels it with considerable pressure, if required, at the top.' Fig. 9 will further explain the construction of this machine.

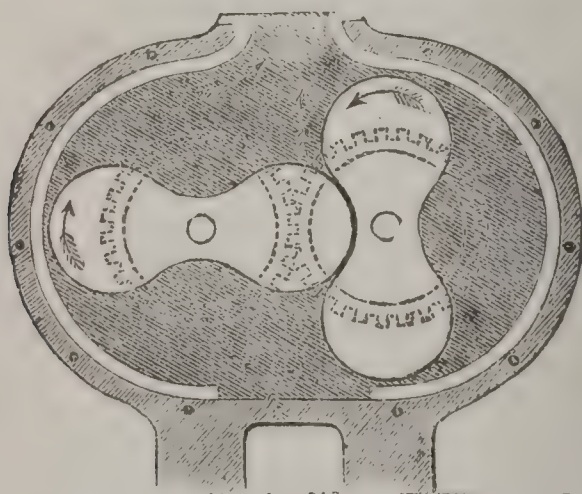


Fig. 9.—Roots' Blowing-machine.

It gives a much greater pressure of blast than is attainable by the fan.

For the purposes of ventilation, and also for expelling accumulations of hot air, dust, waste flyings, etc., in factories, a machine has been constructed by J. Howorth, of Farnworth, England, called a *revolving Archimedean screw-ventilator*. It consists of an Archimedean screw inclosed in a tube with proper means of lubrication. Its diameter is 30 inches, and it is made to be set in motion by steam or other power, but it is also furnished with a hood, on the top of which there are curved vanes, which turn the screw by the action of the wind. Immediately beneath these, there is another series of lateral vanes for the escape of the hot air.

BLOW-PIPE: small instrument used in the arts for soldering metals, and in analytical chemistry and mineralogy, for determining the nature of substances by the action of an intense and continuous heat, its principle depending on the fact that when a jet of air or oxygen is thrown into a flame, the rapidity of combustion is increased, while the effects are concentrated by diminishing the extent or space originally occupied by the flame.

The B. generally consists of a conical tube of metal,

BLOW-PIPE.

about eight inches long (fig. 1), closed at the wider or lower end, but open at the narrow or upper end, *a*, which latter constitutes the mouthpiece, and is turned over to admit of the lips closing perfectly round it. Near the lower end, a small tube, fitted with a finely perforated nozzle, *b*, is inserted at right angles to the large tube—the space below being intended as a chamber for condensing the moisture of the breath; through this nozzle, a fine current of air can be projected against the flame experimented with.

When a current of air from the B. is directed against a candle or gas-jet, the flame almost entirely loses its luminosity, owing to the perfect combustion of the gases evolved from the source of heat, and is projected in a lateral direction, as a long pointed cone, consisting of three distinct parts (fig. 2). The first or central cone is of a dark-blue color, and there the combustion is complete from the excess of



Fig. 1.



Fig. 2.

air thrown in from the small nozzle. The second cone, or that immediately surrounding the first, is somewhat luminous; and here the oxygen being insufficient for the combustion of the carbon, any metallic oxide subjected to the action of this portion of the flame is deprived of its oxygen, and reduced to the condition of metal; for this reason the luminous cone is generally termed the *reducing flame* of the blow-pipe. Beyond the second cone, or where the flame comes freely in contact with the atmosphere, and abundance of oxygen is present to effect complete combustion of the gases, is a third, or pale yellow envelope, containing excess of atmospheric air at a very high temperature, so that a portion of metal, such as lead or copper, placed at this point, becomes rapidly converted into its oxide: this outer part of the flame is on this account called the *oxidizing flame* of the blow-pipe.

Substances under examination before the B. are generally supported either on wood-charcoal or platinum—the latter in the condition of wire or foil. In applying the B. test, the body to be examined is either heated alone, or with some flux or fusible substance; in some cases, for the purpose of assisting in the reduction of metals from their ores and other compounds; in others, for the production

BLOW-PIPE AND ARROW.

of a transparent glassy bead, in which different colors can be readily observed. When heated alone, a loop of platinum wire, or a piece of charcoal, is generally employed as a support; the former when the color of the flame is to be regarded as the characteristic reaction, the latter when such effects as the oxidation or reduction of metallic substances are to be observed.

The following are exemplifications of the difference of color communicated to the flame by different substances: Salts of potash color the flame *violet*; soda, *yellow*; lithia, *purplish red*; baryta, *yellowish green*; strontia, *carmine*; lime, *brick red*; compounds of phosphoric acid, boracic acid, and copper, *green*. The commonly-occurring metallic oxides reducible by heating on charcoal alone in the inner flame of the B. are the oxides of zinc, silver, lead, copper, bismuth, and antimony; the principal ores not so reducible are the alkalies and alkaline earths, as also the oxides of iron, manganese, and chromium. The fluxes generally used in B. experiments are either carbonate of soda, borax (biborate of soda), or the ammonia-phosphate of soda, otherwise called *microcosmic salt* (q.v.). The carbonate of soda, when heated on platinum-wire in the oxidizing flame, forms with silica a *colorless glass*; with oxide of antimony, a *white bead*, etc. The following metals are reduced from their compounds when heated with carbonate of soda on charcoal in the inner flame of the B.; viz., nickel, cobalt, iron, molybdenum, tungsten, copper, tin, silver, gold, and platinum. When compounds of zinc, lead, bismuth, arsenic, antimony, tellurium, and cadmium are similarly treated, these metals are also formed, but being volatile, they pass off in vapor at the high temperature to which they are exposed.

Borax, as a flux, is generally mixed with the substance under examination, and placed on platinum wire. When thus heated in either of the flames, baryta, strontia, lime, magnesia, alumina, and silica, yield *colorless beads*; cobalt gives a *fine blue color*; copper, a *green*; etc. With microcosmic salt, the results obtained are generally similar to those with borax, and need not be specially mentioned, as the test is applied in the same way. The B. has been long used by goldsmiths and jewellers for soldering metals, and by glass-blowers in fusing and sealing glass tubes, etc.; it has also been applied in qualitative analysis for many years, but more recently chemists (especially Plattner) have given great attention to its use, and have even employed it with much success in *quantitative* chemical analysis; the advantages being that only a very small quantity of material is required to operate upon, while the results may be obtained with great rapidity and considerable accuracy.

BLOW'-PIPE AND AR'ROW: a kind of weapon much used by some of the Indian tribes of S. America, both in war and for killing game. It consist of a long straight tube, in which a small poisoned arrow is placed, and forcibly expelled by the breath. The tube or blow-pipe, called *gravatána*, *pocuna*, etc., is 8-12 ft. long, the bore not generally large enough to admit the little-finger. It is

BLOWZE—BLÜCHER.

made of reed or of the stem of a small palm. Near Pará, it is in general very ingeniously and nicely made of two stems of a palm (*Iriarteia setigera*, see **IRIARTEA**) of different diameters, the one fitted into the other, in order the better to secure its perfect straightness. A *sight* is affixed to it near the end. The arrows used in that district are 15–18 inches long, made of the spines of another palm, sharply pointed, notched so as to break off in the wound, and their points covered with *curari* (q.v.) poison. A little soft down of the silk-cotton tree (q.v.) is twisted round each arrow, so as exactly to fit the tube. In Peru, arrows of only 1½–2 inches long are used, and a different kind of poison seems to be employed. An accidental wound from one of these poisoned arrows frequently proves fatal. In the hand of a practiced Indian, the B. and A. is a very deadly weapon, and particularly when directed against birds sitting in the tops of high trees. As his weapon makes no noise, the hunter often empties his quiver before he gathers up the game, and does more execution than an English sportsman could with his double-barrelled fowling-piece.

BLOWZE, n. *blowz* [AS. *blysan*, to blaze; *blyse*, a torch. Dut. *blose*, the redness of the cheeks; *blozen*, to blush]: in *OE.*, a girl whose face looks red by active exercise in the open air; a ruddy fat-faced woman. **BLOWZY**, a. *blow'zī*, fat and ruddy; glowing with redness, as the face; disordered in the hair and head-dress.

BLUBBER, n. *blūb'ber* [an imitative word, expressing the noise made by a mixture of air and water spluttering, as *the water blubbers up*, in the sense of froth: Gael. *plu-braich*, a puddling in water: Low Ger. *blubbern*, to sputter]. a fatty, swollen substance; the coating of fat of a whale or seal; the sea-nettle, jelly fish, or medusa: V. to shed tears and slaver as a child; to weep in a noisy manner. **BLUB'BERING**, imp.: **ADJ.** slaving and childish weeping. **BLUB'BERED**, pp. *-berd*: **ADJ.** swollen with weeping. **BLUB'BERER**, n. one who.

BLUBBER: see **CETACEA**: **WHALE**: **WHALE-FISHERY**.

BLÜCHER, *blü'chér*, **GEBHARD LEBERECHE** VON, Prince of Wahlstadt, Field-marshal of Prussia: 1742, Dec. 16—1819, Sep. 12; b. Rostock, in Mecklenburg-Schwerin, west Germany. At the commencement of the Seven Years' War, he joined a regiment of Swedish hussars, and in his first action was taken prisoner by the Prussian hussars, whose colonel persuaded him to exchange out of the service of Sweden into that of Prussia, and gave him a lieutenancy. A lieut., Jägersfeld, having been promoted over B.'s head, he immediately wrote to Frederick the Great as follows: 'Von Jägersfeld, who has no merit except that of being son of the Markgraf of Schwedt, has been put over my head: I beg to request my discharge.' The result was, that B. was put under arrest, and after repeated applications for discharge, he received from Frederick the curt intimation: 'Captain Blücher is at liberty to go to the devil!' B. went instead to his estate of Grossradow, in Pomerania, and applied himself to farming; but he soon

tired of a bucolic life. In 1793, having returned to the army, he fought, as colonel of hussars, against the French on the Rhine, evincing great genius as a leader of cavalry. The breaking out of the war of 1806 led him, as lieut.gen., to the battle of Auerstadt. B., with the greater part of the cavalry, occupied the left flank of the Prince of Hohenlohe in the retreat to Pomerania. He is accused, on this occasion, of not giving the prince due support, and thus leading to the capitulation at Prenzlau. B. himself then marched into the territory of the free town of Lübeck, and hastily fortified the city; but the French took it by storm, and B. was forced to surrender at Ratkow, near Lübeck, whither he had escaped with a few troops. A fortnight after, he was exchanged for the French general Victor; and immediately on his arrival in Königsberg, was sent, at the head of a corps, by sea, to Swedish Pomerania, to assist in the defense of Stralsund. After the peace of Tilsit, he was employed in the war-dept. in Königsberg and Berlin, and subsequently became commander in Pomerania. At a later period, he was pensioned, with several other men of note, at the instance, it was said, of Napoleon. He was one of the few to combat the general belief in the invincibility of Napoleon, which had grown into a sort of fatalism in high places. In common with Stein and Hardenberg, he labored to remove all weak and unpatriotic counselors from the person of the king. When all the leaders of the army lost courage his constancy revived confidence, and made him the centre of all hope for the future. When the Prussians at last rose in opposition to France, B. was appointed to the chief command of the Prussians and of Gen. Winzingerode's Russian corps. At the battles of Lützen, Bautzen, and Haynau, he displayed heroic courage. At the Katzbach, he defeated Marshal Macdonald, and cleared Silesia of the enemy. In vain did Napoleon himself attempt to stop the 'old captain of hussars,' as he called him, in his victorious career. In the battle of Leipsic he won great advantage over Marshal Marmont at Möckern, 1813, Oct. 16, and on the same day pressed on to the suburbs of Leipsic. On the 18th, in conjunction with the crown-prince of Sweden, he had a great share in the defeat of the French, and on the 19th his troops were the first to enter Leipsic. B., in opposition to the policy of Austria, continually pressed the taking of Paris as the real aim of the war. In 1814, Jan. 1, he crossed the Rhine, garrisoned Nancy on the 17th, and after winning the battle of La Rothière, pressed forward to Paris; but his scattered corps were routed by Napoleon, and he fought his way back to Chalons with great loss. On Mar. 9, however, he defeated Napoleon at Laon; and at the end of the month, after being joined by Schwarzenberg and his corps, he again advanced toward Paris. The day at Montmartre crowned the brilliant deeds of this campaign, and, Mar. 31, B. entered the French capital. Frederick William III. created him Prince of Wahlstadt, in remembrance of the victory at the Katzbach, and gave him an estate in Silesia. In England, whither he followed the

BLUDGEON.

allied sovereigns, he was received with an enthusiasm never before excited by a German. The Univ. of Oxford conferred on him the degree of Doctor of Laws. After Napoleon's return, 1815, B. once more assumed the general command, and promptly led the army into the Netherlands. In 1815, June 16, he lost the battle of Ligny, in which he was personally in great danger, from his horse falling on him. The victory of the allies at the battle of Waterloo was completed by B.'s timely appearance on the field. B. ordered his Prussians to pursue the flying enemy, which they did the whole night. Declining the offered truce, B. marched again against Paris, and on the second taking of that city manifested a strong desire to retaliate on Paris the spoliation that other capitals had suffered at the hands of the French; but he was held in check by the Duke of Wellington. In order to reward B.'s services to Prussia and the common cause, Frederick William III. created a new order, the badge of which consisted of an iron cross surrounded by golden rays. In 1819, Aug. 26, a colossal bronze statue was erected in his honor in his native town. B. died, after a short illness, at his estate of Krieblowitz, in Silesia. In Berlin, a statue 12 ft. high, modelled by Rauch, and cast in bronze by Lequine and Reisinger, was erected to his memory, 1826, June 18, and at Breslau another, also executed by Rauch, in 1827. In the beginning of the campaign of 1813, his characteristic activity and the style of his attacks gained him the nickname of 'Marshal Forward' from the Russians; it soon became his title of honor throughout Germany. His tactics were always much the same: to attack the enemy impetuously, then to retreat when the resistance offered was too great for his troops to overcome; to form again at a little distance, and watch narrowly the movements of the enemy, and whenever an advantage offered itself, to charge with lightning speed, and throw him into disorder, make a few hundred prisoners, and retire ere the opposing force had recovered from its surprise. Such were his usual maneuvers. B., as a man and as a soldier, was rough and uncultivated, but energetic, open, and decided in character. His ardent enthusiasm for the liberation of Prussia and Germany from a foreign yoke, and his uncompromising pursuit of this noble aim, have justly rendered him a hero in the eyes of the German people. The old red uniform, and the old name of 'Blücher's Hussars,' were restored to the 5th Regt. of Hussars by Frederick William IV., on occasion of the centenary celebration of B.'s birthday.

BLUDGEON, *n.* *blūj'ūn* [Goth. *blyggwan*, to strike, to kill: Irish. *blocan*, a little block: compare Gael. *bloagh*, strength: *dion*, security: a probable corruption of *blood*, as being able to cause bloodshed]: a short heavy stick, used for offense and defense.

BLUE.

BLUE, n. *bló* [AS. *bleo*; O. H. G. *blaw*, blue: Icei *blár*, livid: F. *bleu*, blue—from mid. L. *blārus*, a sky-color, blue: Gael. *glas*, pale, wan]: the color of the clear sky; one of the primary colors; azure: **ADJ.** resembling blue; dejected: **V.** to make blue. **BLUING**, imp. **BLUED**, pp. *blōd*. **BLUENESS**, n. the quality of being blue; livid look; indecent writing or conduct. **BLUISH**, a. tinged with blue. **BLUISHLY**, ad. *-li*. **BLUISHNESS**, n. **BLUE-GOWNS**, a class of privileged mendicants in Scotland who received on the sovereign's birthday blue cloth for a coat and gown, a badge of privilege, a small sum of money, and a slight refreshment. **BLUE JACKET**, n. *bló'jāk ĕt*, a British sailor, so named from the color of his coat or jacket. **BLUE-FISH**, n. a species of *Coryphæna*, found in the Atlantic; the *Pomatomus saltatrix* a fish like a mackerel but larger, found on the Atlantic coast of the United States. It is called also Horse-mackerel and Salt-water Tailor. **BLUE MONDAY**, the Monday preceding Lent, when, in the 16th c., the churches were internally decorated with blue. **BLUE-OINTMENT**, mercurial ointment. **BLUE-PILL**, a pill containing mercury. **BLUE-STOCKING** [a literary club of last century, chiefly of ladies, so called from the leading member, a gentleman, always appearing in *blue stockings*]: a term applied to ladies devoted to literature. **BLUE STONE**, also called **BLUE VITRIOL**, sulphate of copper used as a caustic. **BLUE-SHONE**, an Australian miner's term for the basaltic lava through which they have sometimes to dig in search of gold. **BLUE-JOHN**, a miner's term for fluor or Derbyshire spar. **BLUE-BONNET**, in *Scot.*, a cap woven of thick blue worsted yarn—so named from their bell-shape and blue color. **BLUE-BELL**, a name applied to two British plants—1, the common wild hyacinth, flowering in spring, the *Hyacinthus nonscriptus*, ord. *Liliacæ*; 2, the Scotch blue-bell, flowering in summer, the *Campānula rotundifolia*, ord. *Campānulacæ*. **BLUE-BOTTLE**, a large fly with a blue abdomen; a wild plant having a blue flower, the *Gentauria cyanea*, ord. *Composite*; a familiar name for a policeman, from the color of his dress. **BLUE-BOOK**, a book containing a government official return or report, so called from its *blue cover*. **BLUE-BREAST**, a bird. **BLUE-CAP**, a small bird; a fish. **BLUE-DEVILS**, or the **BLUES**, *blóz*, colloquial name for certain appearances presented to the diseased brain, which accompany delirium tremens, or which follow a drinking debauch; great depression or lowness of spirits, as the result of drinking. **BLUES**, the Eng. regiment of Royal Horse Guards, so named from the color of their clothing. **BLUE-LIGHT**, a signal rocket. **BLUE-PETER** [*-peter*, for *repeater*]: a small blue flag with a white square in the centre; used to signify that the ship on which it is raised, or the fleet on whose flagship it is raised, is about to sail. **BLUE-PRINTING** (see **PHOTOGRAPHY**). **PRUSSIAN-BLUE**, a color or dye, formed by adding a ferric salt to prussiate of potash. **TRUE BLUE**, denoting unswerving fidelity; a spotless reputation—supposed to be from the blue badge of the Scottish Covenanters. **BLUE BLOOD**, a name applied to aristocratic and old families, the

BLUE.

phrase having its origin in Spain. To LOOK BLUE, to look depressed or low-spirited; to appear disconcerted. BLUE-COAT SCHOOL, Christ's Hospital, so named from the long blue coats or gowns worn by the boys, according to an old costume: see CHRIST'S HOSPITAL.

BLUE: one of the primary colors, azure, of which there are several varieties used in the arts, noted below: see also COLOR. Blue, or, as it is sometimes termed, *True Blue*, was the favorite color of the Scottish Covenanters in the 17th c. When their army entered Aberdeen, says Spalding, there were few of them without a blue ribbon; this color being probably adopted in contradistinction to the red of the royal forces. At the battle of Bothwell Bridge, the flag of the Covenanting army was edged with blue. From these usages, blue seems to have become the partisan color of the whigs, but commonly in association with orange or yellow, in memory of the House of Orange and the revolution settlement. This combination of blue and yellow is seen in the liveries of certain whig families of distinction, and also in the cover of the *Edinburgh Review*. Blue is the color of the uniform of the royal navy of England: it is of a dark tint, and is known as *Navy Blue*.

AZURE BLUE is a pigment prepared by mixing 2 parts of deep blue, 1 of oxide of zinc, and 4 of lead glass; the latter consisting of 4 parts of minium and 1 of sand. The above azure blue is for skies, but a pigment for more general use is prepared from 11 fused borax and 67 gray flux; the latter being itself made from 89 pebble flux, 75 minium, and 25 sand.—BERLIN BLUE: see PRUSSIAN BLUE.—BRUNSWICK BLUE, or *Celestial*, is made by precipitating the alumina from a solution of alum by carbonate of soda, washing the precipitate, and adding sulphate of baryta, sulphate of iron, yellow prussiate of potash, and some bichromate of potash. When dried, this mixture is known as Brunswick blue, but when the sulphate of baryta is left out, and the material not dried, it is called *Damp Blue*.—CERULEAN BLUE, is a color used in pottery, and consists of 79 parts of gray flux, 7 carbonate of cobalt, 14 hydrated carbonate.—BLUE COLOR OF FLOWERS, or *Anthocyanine*, may be obtained from those petals of flowers which are blue, by digesting them in spirits of wine in the dark. The color is soluble in alcohol, but is precipitated from its alcoholic solution by water. It is changed to red by acids, and to green by alkalies.—BLUE COPPERAS, or the Sulphate of Copper: see COPPER.—BLUE DYES: see INDIGO: LITMUS: PRUSSIAN BLUE: DYEING.—IRON EARTH BLUE occurs native among bog iron ore and in mossy districts in Europe and New Zealand. It consists mainly of a phosphate of iron with a little alumina, silica, and water. It is called *Native Prussian Blue*.—INDIGO BLUE, in pottery-ware, consists of 13 parts of carbonate of cobalt, 26 hydrated carbonate of zinc, and 61 gray flux.—COBALT BLUE is the only really good and serviceable blue in the coloring of glass and porcelain, and is essentially the oxide of cobalt (CoO), the coloring power of which is so great, that the addition of $\frac{1}{1000}$ part to white glass is sufficient to render it

BLUE.

blue. Several of the compounds named above owe their blue color to this substance: see COBALT.—DEEP BLUE is employed in porcelain coloring, and is made from 1 part of oxide of cobalt, 4 glass of lead (2 minium, 1 white sand), 1 lead glass (2 minium, 1 sand, 1 calcined borax), and 1 oxide of zinc, all of which are placed together in a porcelain crucible, fused for 2 or 3 hours; the residue washed, dried, and ground to a fine powder.—KING'S BLUE is made from 29 parts carbonate of cobalt, 29 sand, and 42 carbonate of potash, by fusing these ingredients in a crucible. The residue is intense deep blue, bordering on a black blue, and is generally reduced to powder, and re-fused with about half its weight of pebble flux (3 minium or litharge, and 1 sand).—MINERAL BLUE and PARIS BLUE: see PRUSSIAN BLUE.

PRUSSIAN BLUE is the deep blue color which is so frequently seen on cotton, muslin, and woolen handkerchiefs and dresses. It was discovered, 1710, by Diesbach, a color-maker in Berlin, and hence called *Berlin Blue*. The mode of its manufacture was published in Britain, by Dr. Woodward, 1724. It may be prepared in several ways: 1. By the addition of a solution of yellow prussiate of potash (ferrocyanide of potassium) to a solution of sulphate of iron (green vitriol). The blue compound thus produced deepens in tint when exposed to the air; and where it is required of greater consistence or more *body*, some alum and carbonate of potash are added to the prussiate solution before mixing with the iron solution. 2. By mixing solutions of yellow prussiate of potash and perchloride of iron, which yields the variety known as *Paris Blue*. 3. By adding a solution of the red prussiate of potash (ferrocyanide of potassium) to a solution of sulphate of iron, and this mode of preparation gives *Turnbull's Blue*. The Prussian blue settles to the bottom of the mixing vessels, and may be collected and dried by exposure to the air, when it is obtained as a blue powder. If heat be applied during the drying, the material cakes, and when cut exhibits a lustre and hue like copper. When alum has been used in its manufacture, the product has a dull earthy fracture. The composition of Prussian blue is that of a ferrocyanide of iron. See CYANOGEN. It is employed by washerwomen, under the name of *blue*, for neutralizing the yellow tint of cotton and linen clothes; by paper-makers, to color paper; and is very largely employed as a pigment in CALICO-PRINTING (q.v.) and DYEING (q.v.). *Mineral Blue* is formed when the Prussian blue is precipitated with a solution of zinc or magnesia, or moist carbonates of zinc or magnesia are added during the precipitation of the color. In the formation of *Royal Blue*, a solution of tin is added, and *Steam Blue* is produced on the addition of solutions of tartaric acid and yellow prussiate of potash. The impurities liable to be present in Prussian blue are starch, chalk and stucco, either of which necessarily decreases the intensity of the blue color, and the utility of the substance.

SAXONY BLUE is prepared by dissolving indigo (q.v.) in Nordhausen sulphuric acid, and was first manufactured in Saxony, 1810, by taking the very finely powdered indigo

BLUEBEARD—BLUEBIRD.

and incorporating it with the acid cautiously heated, when the indigo dissolves, and yields a blue color of great depth of tint. It is largely used in dyeing (q.v.).—OLD SEVRES BLUE is a cobalt blue used in pottery, and is made up of 19 parts oxide of cobalt, 39 dry carbonate of soda, 3 dry borax, and 39 sand.—THENARD'S BLUE is the blue formed by heating alum with a solution of cobalt, or it may be formed by igniting a mixture of phosphate or arseniate of cobalt with eight times its weight of alumina in the hydrated state procured by precipitation from alum by ammonia: used in pottery.—TURQUOISE BLUE is composed of 3 of oxide of cobalt, 4 of alumina, and 1 oxide of zinc. It is manufactured by dissolving the oxides of zinc and cobalt in dilute sulphuric acid, adding the liquid to a solution of 40 parts of ammonia alum, drying up and igniting at a red heat for several hours. The addition of a little chromate of mercury gives it a green shade.—VARIEGATED BLUE is used for coloring porcelain, and is formed by fusing 10 oxide of cobalt, 9 oxide of zinc, 5 lead glass (2 minium, 1 sand, and 1 calcined bones), and 25 glass of lead (2 minium and 1 sand).

BLUE STONE, or BLUE VITRIOL, is sulphate of copper: see COPPER.

BLUEBEARD: hero in a well-known tale of fiction, which is of French origin. According to this romance, the Chevalier Raoul has a blue beard, from which he gets his designation. This personage tests his wife's curiosity by intrusting her, during his absence on a journey, with the key of a chamber which she is forbidden to enter. She is unable to stand the test, and he puts her to death. Several wives share the same fate, but at length the seventh is rescued at the last moment by her brothers, and B. is slain. The tale appears in innumerable collections under various forms. Tieck, in his *Phantasus*, has worked up this material into a clever drama, with numerous romantic and satirical additions, and Grétry has made use of it in his opera of *Raoul*.

The historic original of Chevalier Raoul appears to be one Giles de Laval, Lord of Raiz, who was made marshal of France, 1439, and fought valiantly in defense of his country when invaded by the English; but his cruelty and wickedness seem to have eclipsed his bravery, as he is remembered chiefly for his crimes, which credulous tradition has painted in the blackest and most fearful colors. He is said to have taken a pleasure, among other atrocities, in corrupting young persons of both sexes, and afterward in murdering them for the sake of their blood, which he used in his diabolical incantations. Out of this fact, in itself probably half-mythical, the main feature of the tale of B. has probably grown. Laval was burnt alive in a field near Nantes, 1440, on account of some state-crime against the Duke of Brittany.

BLUEBELL: see HYACINTH.

BLUE BIRD, or EASTERN BLUEBIRD, or WILSON'S B. (*Sialia sialis*): bird of sub-family *Saxicolinæ*, family

BLUE-BOOKS.

Turdida; N. Amer. e. of the Rocky Mts. There are 2 other species—the WESTERN B. (*S. mexicana*), belly grayish-blue, instead of white; and the ROCKY MT. B. (*S. arctica*), no chestnut color.—The EASTERN B. is a favorite with all classes of people in the United States as is the redbreast in Britain. Except in the southern states, it is chiefly known as a summer bird of passage, appearing early, however, as a harbinger of spring, and visiting again ‘the box in the garden, or the hole in the old apple-tree, the cradle of some generations of ancestors.’ It is common with farmers to provide a box for the B.’s nest. In size, the B. rather exceeds the redbreast, which, however it much resembles in general appearance. Its



Blue Bird (*Sialia sialis*).

food also is similar. The upper parts of the B. are of a rich sky-blue color, the throat and breast are reddish chestnut, and the belly white. The female is duller in colors than the male. The B. lays five or six pale-blue eggs, and has two or three broods in the season. Its song is ‘a soft agreeable warble.’ The male is remarkably attentive to his mate, and both exhibit extraordinary courage in driving away intruders from the vicinity of their nest. A hen, with her brood, has been seen to flee from the attacks of an enraged and pugnacious blue bird. The B. is known as an inhabitant of the Bermudas, Mexico, the West Indies, Guiana, and Brazil.—In the western and in the more northern parts of N. America, its place is taken by nearly allied and very similar species.

BLUE'-BOOKS: name popularly applied to the reports and other papers printed by parliament, because they are usually covered with blue paper. The term was, for like reasons, long applied to the reports sent annually by the governors of colonies to the colonial secretary; and even in technical official phraseology, these are called ‘blue books.’ The practice of printing, and to some extent pub-

BLUE-BOTTLE FLY—BLUEFISH.

lishing, the proceedings of the house of commons began in 1681. The chief contents of these papers at present are: votes and proceedings of the house; bills; estimates for the public services; accounts of annual expenditure; any documents which the ministry may submit voluntarily or on demand of the house; reports of committees of inquiry; and annual reports by the permanent commissions and govt. depts. The B. of a session now often fill 50 or 60 thick folio volumes.

There is no doubt that, though means are provided for finding what the B. contain, their contents are heterogeneous, and to a great extent cumbersome and valueless. They are not prepared on any uniform system, or subjected to general revision or editing. Each officer prepares his own report in his own way, sometimes lauding his own services, or arguing in favor of his own peculiar principles on some public question, so that it has been remarked that the B. contain a large number of articles like those in the periodical press, but too cumbersome and dull to get admission there.

Publications of the U. S. govt. or congress are not distinguished by any name founded on the color of their wrapping or covers. The official books of the govt. of France are yellow; Germany and Portugal, white; Italy, green; Spain, red; and it is customary to speak of them respectively as 'yellow books,' 'green books,' etc.

BLUE'-BOTTLE FLY: see FLESH-FLY.

BLUE CAR'DINAL: see LOBELIA.

BLUE'-EYE (*Entomyza cyanotis*): a beautiful little bird, abundant and very generally dispersed in New S. Wales, though not found in the more southern Australian colonies. It is a species of Honey-eater (q.v.) or Honey-sucker. It is a spirited bird, of elegant and graceful movements. The B. seeks its food almost exclusively among the blossoms and small leafy branches of *Eucalypti*. Numbers are often seen together clinging and hanging in every variety of position, frequently at the extreme ends of the small, thickly-flowered branches, bending them down with their weight.

BLUEFIELDS: river in the state of Zelaya, Nicaragua, which, after a course of several hundred miles to the e., enters the Caribbean Sea in lat. 12° n., and long. 83° w. Its lower stream is navigable to a distance of 80 m. from the sea. At its mouth is a good harbor, above which is the town of B., formerly the residence of the king of the Mosquito territory (q.v.).

BLUE'FISH (*Pomatomus saltatrix*): fish of the family *Pomatomidæ* of a genus having no detached finlets, no isolated dorsal spines, and no lateral armature of the tail, two dorsal fins, the first of which is small, and two deeply-hidden spines in front of the anal fin. The only known species is a native of the e. coast of N. and S. America. The upper parts are of a bluish color, the lower parts whitish; a large black spot at the base of the pectoral fins.

BLUE-GOWNS—BLUE LAWS.

The mouth is crowded with teeth, the jaws are furnished with large ones. The B. preys on other fishes, as the weak-fish, menhaden, and mackerel, the shoals of which it pursues. It is very swift, strong, and voracious. It sometimes attains a length of three feet and a weight of 14 pounds. It is much esteemed for the table, and great numbers are brought to market in Boston, New York, Philadelphia, and other towns about the end of summer. It is often caught by trolling, as it bites readily at any object drawn swiftly through the water. It frequently ascends rivers even to fresh water.

BLUE'-GOWNS: name commonly given to a class of privileged mendicants in Scotland. The proper designation of these paupers was the King's Bedesmen, or Beads-men. In ancient times, a beadsman was a person employed to pray for another: see **BEAD**. From practices of this kind, there sprang up a custom in Scotland of appointing beadsmen with a small royal bounty, who ultimately degenerated into a class of authorized mendicants. Each of the beadsmen on his majesty's birthday received a gown or cloak of blue cloth, with a loaf of bread, a bottle of ale, and a leathern purse containing a penny for every year of the king's life. Every birthday, another beadsman was added to the number, as a penny was added to each man's purse. The most important part of the privilege was a large pewter badge, attached to the breast of the gown, which, besides the name of the bearer, had the inscription, *Pass and Repass*. This inferred the privilege of begging, and bespoke the kindly consideration of all to whom the beadsman appealed for an alms or a night's lodging. The fictitious character of Edie Ochiltree, in Sir Walter Scott's tale of the *Antiquary*, is a fair sample of this ancient and picturesque fraternity. The practice of appointing beadsmen was discontinued in 1833, at which time there were sixty on the roll. The whole have since died out. The last beadsman drew from the exchequer in Edinburgh his last allowance, 1863, May.

BLUE GRASS, or JUNE GRASS (*Poa pratensis*): a common species of grass, produced of the finest quality in central Kentucky, where a region called the 'Blue Grass Country,' is noted for the superiority of its cattle.

BLUEING OF METALS: see **TEMPERING METALS**.

BLUE LAWS: a term applied to laws aiming to secure an impracticable or fictitious morality, some of them severe, enacted in the 17th c. in some of the New England colonies, especially to laws of the New Haven and Connecticut colonies. No code was ever enacted under the name B. L., but the Rev. Samuel A. Peters—a tory minister of the Episc. Church, compelled by the American revolution to flee to England—published 1781 an untruthful *General History of Connecticut*, in which he misrepresents the actual laws in a sketch of such a code for the sake of making non-conformists obnoxious. The term *blue* was applied reproachfully, in the time of Charles II., to those pro

BLUE-MANTLE—BLUE MOUNTAINS.

fessedly virtuous and conscientious; thus in Butler's satire *Hudibras*:

'For his religion, it was fit
To match his learning and his wit;
'Twas Presbyterian true blue.'

Severe and cruel penalties for even many non-criminal acts were common in all countries at the time, and not at all peculiar to New England. In England under James I., there were defined 31 offenses with death penalties, which in 1819 had increased to 223. The first code of Massachusetts, 1641, of Connecticut, 1642, named only 12 capital offenses, reserving discretion to the courts in even these cases—making New England here more than a century in advance of England. (See Phillimore's *History of England during the Reign of George III.*) The New England colonists in general took the Mosaic 'code' for their model. The capital laws established by Massachusetts, 1642, Dec. 1, expressly refer to the following as authority for the several articles: (1) Deut. xiii. 6; xvii. 2; (2) xviii. 10, 11; Lev. xx. 27; (3) xxiv. 15, 16; (4) Ex. xxi. 12-14; (5) xxi. 14; (6) Lev. xx. 15, 16; (7) xx. 13; (8) xx. 10; xviii. 20; (9) Deut. xxii. 25; (10) Ex. xxi. 16; (11) Deut. xix. 16, 18, 19. Like laws, including a twelfth making conspiracy against the commonwealth a capital offense, were enacted in Connecticut. There were laws punishing, by fine or imprisonment, idleness, lying, gaming, contempt of God's word, etc. Though indefensible in some cases, in general the laws were beneficial. (See *Blue Laws, True and False*, ed. by Trumbull; Hartford, 1876.)

BLUE-MANTLE: title of an English pursuivant-at-arms: see **PURSUIVANT**.

BLUE MONDAY: the Monday before Lent, observed in Europe in the 16th c. as a holiday, when the churches were trimmed with blue. The observance gave rise to social excesses, and was abolished.

BLUE MOUNTAINS: a mountain-chain in New South Wales. This chain runs very nearly parallel with the coast, and being impassable by nature, long threatened to cut off the maritime part of the colony from the interior. To cross this apparently insurmountable barrier was the great aim of the colony during the first 24 years of its existence, Surgeon Bass, the discoverer of the strait that bears his name, standing pre-eminent among the adventurous and patient explorers. It was not till 1813 that a practicable passage was found, or rather made, for it terminated toward the w. in a zigzag road down a nearly perpendicular height of 670 ft; but it was not till 1815, Apr. 25, that Gov. Macquarie, with a numerous retinue, actually opened a route into the Bathurst Plains, then yielding the richest pasturage in the colony, and now forming its gold-field. The highest point of the B. M., Mount Beemarang, is 4,100 ft. high, and some parts of the road which crosses them are about 3,400 ft. above the sea. A line of railway crosses the B. M., in the construction of which great engineering difficulties have been overcome part of it being carried along the face of a precipitous mountain.

BLUE MOUNTAINS—BLUE STOCKING.

BLUE MOUNTAINS: a range of mountains in Jamaica, traversing the whole length of the island, and in some places attaining an altitude of 7,000 ft.

BLUE-PETER [Eng. *blue*, and *peter*, orig. *repeater*]: blue flag bearing in the centre a white square; it is hoisted to the head of the royal mast of merchantmen, to betoken that the vessel is in readiness to set sail, and that it is time for all hands to come aboard.

BLUE PILL (*Pilula hydrargyri*): the most simple form in which mercury can be administered internally. It consists merely of *two* parts of mercury rubbed up with three parts of conserve of roses, till globules of mercury can no longer be detected; to this is added powdered licorice-root, so that a pill of five grains contains one grain of mercury.

In cases of torpid condition of the liver or inflammation of that organ, B. P. is used as a purgative, either alone or combined with some other drug, such as rhubarb. When it is given with the view of bringing the system under the influence of mercury (Salivation, q.v.), small doses of opium should be added to counteract its purgative tendency, and the state of the gums watched carefully from day to day, so that the first symptoms of salivation may be noticed, and the medicine omitted. As a purgative, the common dose of B. P. is one or two pills of five grains each, followed by a purgative draught; but the use of B. P. is always attended with danger, as mercury varies in effect: 3 pills taken one on each of 3 successive nights have brought on fatal salivation. When taking blue pills, all sudden changes of temperature should be avoided; and, indeed, though they are found in every domestic medicine-chest, neither they nor any other form of mercury should be given without good cause and without the greatest caution. The use of B. P. is far less frequent now than formerly.

BLUE RIDGE: the most easterly range of the Alleghanies. It forms an almost continuous chain from West Point in New York down to the n. of Alabama, through New Jersey, Pennsylvania, Virginia, the Carolinas, and Georgia. In Pennsylvania and Maryland it is called South Mountain: in North Carolina the chain has the name of Black Mountains (q.v.). It divides Virginia into Eastern and Western. Mount Mitchell, in N. C., the loftiest point of the B. R., is 6,701 ft. above the sea: the Otter Peaks in Virginia have an altitude of 4,200 ft.

BLUE RIVER, or BAHR-EL-AZBAK: see NILE.

BLUE STOCKING: a name given to learned and literary ladies, who display their acquirements in a vain and pedantic manner, to the neglect of womanly duties and graces. The name is derived from a literary society formed in London about 1780, which included both men and women. A gentleman of the name of Stillingfleet, who was in the habit of wearing blue stockings, was a distinguished member of this society; hence the name, which has been adopted also in Germany and France.

BLUETHROAT—BLUEWING.

BLUETHROAT, or **BLUEBREAST**—called also Blue-throated Warbler and Bluethroated Robin (*Phenicura Suecica*, or *Sylvia Suecica*: see SYLVIADÆ; a beautiful bird, very little larger than a redbreast, and much resembling it, but having the throat and upper part of the neck of a brilliant sky-blue, with a spot in the centre, which in some specimens is pure white, and in very old males is red. Below the blue color is a black bar, then a line of white, and again a broad band of bright chestnut. The B. is well known as a summer bird of passage in many parts of Europe, from the Mediterranean Sea to the Arctic Ocean, but is very rare in Britain. It is supposed to spend the winter in Africa. Great numbers are caught for the table in Lorraine and Alsace. The bird is one of those known by the names of *Becfin* (q.v.) and *Beccafico* (q.v.), and esteemed a delicacy. It is a bird of very sweet song. It imitates to an unusual degree the notes of other birds, so that the Laplanders give it a name which signifies the bird of a hundred tongues.

BLUE VITRIOL: see **COPPER**.

BLUEWING: according to some naturalists, a genus of *Anatide*, which has been named *Cyanopterus* (by a sort of Greek translation of the English name), but more generally regarded as a mere section or subsection of the restricted but still large genus *Anas*. See **DUCK**. The tail-feathers are only 14 in number, instead of 16 as in the common duck, teal, etc.; but the character from which the name is derived is, after all, that which chiefly distinguishes the bluewings, and never fails to arrest attention. The best known species, the Common or Lunate B. (*Anas* or *Cyanopterus discors*), is generally called the blue-winged teal in the United States, where it is very abundant. Vast numbers spend the winter in the extensive marshes near the mouths of the Mississippi, to which they congregate both from the north and from the coast regions of the east; but the summer migrations of the species extend as far north as the 57th parallel, and it is plentiful on the Saskatchewan in the breeding-season. It breeds also in the marshes of the south, even in Texas; and is common in Jamaica, where it is supposed to be not a mere bird of passage, but a permanent resident. None of the duck tribe is in higher esteem for the table, and it has therefore been suggested that the B. is particularly worthy of domestication, of which it seems very easily susceptible. In size it is rather larger than the common teal; in the summer plumage of the male, the upper part of the head is black, the other parts of the head are of a deep purplish blue, except a half-moon shaped patch of pure white before each eye; the prevalent color of the rest of the plumage on the upper parts is brown mixed and glossed with green, except that the wings exhibit various shades of blue, the lesser wing-coverts being of a rich ultramarine blue, with an almost metallic lustre; the lower parts are reddish orange spotted with black; the tail is brown, its feathers short and pointed.—The B. is a bird of extremely rapid and

BLUFF—BLUMENBACH.

well-sustained flight. The flocks of the B. are sometimes so numerous and so closely crowded together on the muddy marshes near New Orleans, that Audubon mentions having seen 84 killed by the simultaneous discharge of the two barrels of a double-barrelled gun.—There are other species of B., also American; but this alone seems to visit the more northern regions.

BLUFF, n. *blaf* [Dut. *blaf*, plain, level, not sloping but rising straight up: compare Gael. *blaodh*, a shout]: a high steep bank generally facing the sea or a river: **ADJ.** abruptly rising as a shore; big; vainglorious; downright; plain and homely; rough; swaggering; blustering. **BLUFF-LY**, ad. *-li*. **BLUFF'NESS**, n. the quality of being bluff; surliness. **BLUFFY**, a. *-fi*, having bold projecting points of land. **BLUFF HEADED**, not pointed; obtuse—applied to a ship that has her stem too straight up. **BLUFF-BOWED**, *-bowed*, applied to a vessel having broad and flat bows.

BLUHME, or **BLUME**, *blû'mê*, **FRIEDRICH**: German jurist: 1797–1874; b. Hamburg. After studying law at Halle, Göttingen, and Jena, he travelled in Italy as a philosophical investigator: see his *Iter Italicum* (4 vols. 1824–37); etc. He was prof. of jurisprudence at Halle, at Göttingen, and at Bonn; and pub. important works on that subject.

BLUM, *blûm*, **ROBERT**: 1807, Nov. 10—1848, Nov. 9; b. Cologne, of a family in very humble life. After a brief military service in 1830, he was employed in a theatre; and 1847 became a bookseller and publisher. In 1840, he founded at Leipsic a soc. celebrating Schiller's anniversary, in honor of political liberty. In 1845, in the political outbreaks of Leipsic, he acquired great repute as a popular orator; and 1848 was elected vice-pres. of the provisional parliament at Frankfort. Joining in the insurrection at Vienna, Oct., 1848, he was arrested and shot. B. was a man of strong character, of great natural intelligence, and a speaker of stirring eloquence.

BLUM, *blûm*, **ROBERT FREDERICK**: artist: 1857, July 9 —————; b. Cincinnati. He studied in New York and in Europe; and after a sojourn in Holland, Venice, and Japan, opened a studio in New York. He was elected Academician 1893; and was made pres. of the Soc. of Painters in Pastel. His brilliant water-colors and pastels early gave him high rank as a painter, especially in figure-pieces. His work in oil also is notable for delicacy of color. His Venetian and Spanish pictures are of recognized excellence—*Venetian Bead Stringers* having received a prize of \$2,500 at the Amer. Art Assoc. exhibition, New York 1889. His work gained recognition (with medals, etc.) at New York 1888, Philadelphia, 1888, Paris 1889, Chicago 1893.

BLUMENBACH, *blô'mên-bâk*, **JOHANN FRIEDRICH**: 1752, May 11—1840, Jan. 22; b. Gotha: eminent naturalist. He studied at Jena and Göttingen, in the latter of which universities he became extraordinary prof., 1776, and ordinary prof., 1778. Here he lectured for 50 years on natural history, comparative anatomy, physiology, and the history of medicine. In 1785, consequently before Cuvier, he made natural history dependent on compara-

tive anatomy, thus placing it on a scientific basis. His *Manual of Comparative Anatomy and Physiology* has been translated into almost all the principal languages of Europe (see ETHNOLOGY). He published many other works on natural history. His *Manual of Natural History* (1780) went through 12 editions in 50 years. In 1825, Sep. 19, his friends celebrated the jubilee of his doctorate, presenting him with a medal struck for the occasion.

BLUMENTHAL, *bló'mèn-tál*, LEONARD VON: Prussian field-marshal: 1810, July 30—1900, Dec. 21; b. Schwedt, on the Oder: one of the most distinguished strategists of modern times. He was educated 1820–27 in the milit. academies at Culm and Berlin; entered the army as 2d lieut. 1827; was as capt. transferred 1849 to the general staff, in which he rapidly rose—being made chief-of-staff in the Schleswig-Holstein army 1849; major in the grand general staff 1853; adjt. of Prince Frederic Charles 1859; col. 1860; chief of the general staff of the combined army against Denmark 1863; maj.gen. 1864; division commander 1866; chief of general staff of the 3d army in the war with France; field-marshal 1888.

BLUNDER, n. *blün'der* [Dan. *pludder*, earth and water mixed together—hence confusion, trouble: Icel. *glundra*, to disturb—from *glundr*, sloppy drink]: a gross mistake; a stupid error: V. to mistake grossly; to err stupidly; to act without reflection. BLUNDERING, imp.: ADJ. stupid; floundering. BLUN'DERED, pp. *-derd*. BLUN'DERER, n. *-der-ér*, one who. BLUNDER HEAD, n. *-héd*. a stupid fellow. BLUN'DERINGLY, ad. *-lì*. *Note*.—Skeat suggests the derivation in a different direction: Icel. *blunda*, to doze, to slumber: Icel. *blundr*; Sw. *blund*, a doze, a nap—as 'to pore over a thing sleepily,' 'to err.'

BLUNDERBUSS, n. *blün'der-büs* [Dut. *donder-bus*—from *donder*, thunder; *bus*, a firearm: Ger. *donnerbuchse*, thunder-gun]: a short, wide-mouthed, very noisy musket with bore wide enough for several bullets; very destructive at close quarters. Since the 17th c. it has entirely passed out of use.

BLUNGER, n. *blün'jër* [corrupted from Eng. *plunger*]: a plunger, a wooden blade with a cross handle, used for mixing clay in potteries.

BLUNT, a. *blünt* [Sw. *blott*, naked, bare: Swiss, *bluntsch*, the sound of a round heavy body falling into the water plump; *bluntschi*, a thick and plump person: Ger. *plump*, rough, heavy, dull]: dull; not sharp; having a thick edge; plain; unceremonious; wanting in manners: V. to take away the sharpness of an edge; to weaken any appetite or passion; to impair any power or affection of the mind. BLUNT'ING, imp. BLUNT'ED, pp. BLUNT'LY, ad. *-lì*, plainly; without circumlocution; roughly. BLUNT'NESS, n. dulness; want of sharpness: the state of having an unpolished, unceremonious manner. BLUNT-WITTED, dull; stupid.

BLUNT, n. [F. *blond*, white]: a slang word for silver money, from its color,

BLUNT.

BLUNT, *blünt*, EDMUND: hydrographer: 1799, Nov. 23—1866, Sep. 2; b. Newburyport, Mass.; son of Edmund March B. He early interested himself in applied mathematics, making, at the age of 17, the first trustworthy survey of New York harbor; three years later the survey of Nantucket shoals; and 1824 of the ocean approaches of New York harbor. He ran the levels for the w. portion of a ship canal on the Nicaragua route 1825-6, and surveyed the whole of Long Island Sound 1827-30. From 1832 till his death he was first assist. of the U. S. coast survey. He urged (1838) the adoption of Fresnel's signal-light system.—His bro. JOSEPH B. (1792-1860) was an eminent lawyer and statistical and historical writer; and one of the founders of the repub. party. He died in Brooklyn.

BLUNT, EDMUND MARCH: 1770, June 20—1862, Jan. 2; b. Portsmouth, N. H.: hydrographer and nautical publisher. His *American Coast Pilot* (1st ed. 1796), with descriptions of all ports in the United States, showing light-houses, sailing directions, etc., rendered such invaluable service to navigation that it has passed through about 30 editions, has been translated into various European languages, and is still in use. He died in Sing Sing, N. Y.

BLUNT, GEORGE WILLIAM: hydrographer and nautical publisher: 1802, Mar. 11—1878, Apr. 19; b. Newburyport, Mass.; son of Edmund March B. From the age of 14 for about 7 years he was a sailor; then for more than 40 years, as partner with his bro. Edmund, publisher of charts, etc., in New York. He was early engaged in various marine surveys. His proposal (1834) of the Fresnel system, and his, and his brother Edmund's subsequent advocacy of it, finally led the govt. to adopt it and to establish the light-house board (1856). He served many years as pilot commissioner and New York harbor commissioner. He died in New York.

BLUNT, JAMES G., M.D.: military officer: 1826-81; b. Hancock co., Me. From the age of 15 he was a sailor five years, then studied medicine, and was a physician 1849-56 in Ohio. He then removed to Kansas, where he was an active opponent of the introduction of slavery. In 1861 he entered the army as lieut.col. 3d Kan. vols.; was promoted brig.gen. 1862, Apr. 8, in command of the Kan. milit. dept.; routed the Confederate forces in several important engagements, and was promoted maj.gen. vols. Nov. 20. In 1863 he commanded the army of the frontier. At critical points, such as Price's last invasion of Kan., Gen. B.'s troops struck decisive blows. After the war, he was a resident of Leavenworth, Kan.

BLUNT, JOHN HENRY, D.D.: Anglican theologian: 1823-1884, Apr. 11; b. Chelsea. After studying in the univ. at Durham, he took orders 1852, and served in various parishes, resigning 1873 the crown living of Beverstone, Gloucestershire. Dr. B. was a most prolific writer, and his books, mostly in a high-church spirit, are of very unequal merit: many are of cyclopedic character. Among his works are *Annotated Book of Common Prayer* (1867); *History of the English Reformation* (1868); *Book of Church*

BLUNT—BLUSHING.

Law (1872); *Dictionary of Doctrinal and Historical Theology* (1870); *Dictionary of Sects* (187) *Annotated Bible* (3 vols. 1878-9). He died in London.

BLUNT, JOHN JAMES: Anglican theologian: 1794-1855, June 18; b. Newcastle-under-Lyme, Staffordshire. He graduated at St. John's Coll., Cambridge. He was a curate in Shropshire; then rector of Great Oakley, Essex, 1834-39; then became Lady Margaret prof. of divinity at Cambridge. He was offered, but declined, the bishopric of Salisbury 1854. Most notable of his works is his *Undesigned Coincidences in the Writings of the Old and New Testaments*—illustrating an admirably convincing line of argument.

BLUNTSCHLI, *blüntsh'lē*, JOHANN KASPAR: Swiss and German jurist: 1808, Mar. 7-1881, Oct. 21; b. Zurich, Switzerland. He became prof. in the univ. at Zurich 1833. After 1839 he was a political leader of the moderate conservatives. He held govt. offices. He was prof. of civil and international law at Munich 1848-61; thereafter prof. in Heidelberg Univ., becoming also a privy-councillor of Baden, where he was active in behalf of civil and ecclesiastical liberty. His Swiss histories are valuable. On international law he is an authority—his greatest work being *Allgemeines Staatsrecht* (5th ed. 1876).

BLUR, n. *bler* [Bav. *plerren*, a blotch on the skin: Dut. *blaar*, a blister]: a smear or blot; a spot; a stain: V. to render indistinct by smearing; to sully or stain; to blemish. BLUR'RING, imp. BLURRED, pp. *blurd*.

BLURT, v. *blért* [Scot. *blirt*, a burst—as a *blirt* of greeting—*i.e.*, a burst of weeping: Dut. *blader*, a bladder: Gael. *blaor*, a cry, a shout]: to throw out suddenly with an explosive sound, as with the mouth; to throw at random; to utter words hastily and unadvisedly. BLURT'ING, imp. BLURT'ED, pp.

BLUSH, n. *blūsh* [AS. *blysa*; Icel. *blys*, a torch: Dan. *blusse*, to blaze: Low Ger. *blüse*, a blaze: Dut. *blosem*, a blossom]: a glow of red on the cheeks or face excited by a sense of modesty, shame, or indignation: V. to redden on the cheeks or face; to carry a blooming color. BLUSH'ING, imp.: ADJ. showing a blush. BLUSHED, pp. *blūsh't*. BLUSH'INGLY, ad. *-lī*, with blushes of modesty. BLUSH'FUL, a. *fūl*, full of blushes. BLUSH'FULLY, ad. *-lī*. BLUSH'LESS, a. without a blush; impudent.

BLUSHING: sudden reddening of the face, neck, and breast, owing to some mental shock, usually of the character of humiliation or shame. The nature and cause of this effect have been recently elucidated by physiological researches. It is produced by an increased flow of blood into the capillary vessels over the parts where the blush extends. Besides reddening the complexion, it creates a sensible augmentation of heat in those parts. The feeling that accompanies the state is of a distressing kind.

The phenomenon of B. is part of a general influence exerted on the capillary circulation by mental causes operating through the brain. The experiments whereby the

BLUSHING.

existence of this influence has been established may be described as follows: The *small blood-vessels*, by which the blood is brought into proximity with the various tissues of the body, are kept in a state of balanced distension between two forces: the one the propulsive power of the heart's action, which fills and distends them; the other, an influence derived from the nervous centres, and acting upon the muscular fibres so as to contract the vessels. The first of the two forces—the agency of the heart—is quite well understood: it is simply like the case of distending the hose of a fire-engine by working the pump, and driving the water along. The counteracting force of the nerve-centres is proved by the following experiments: When the sympathetic nerve proceeding to the vessels of the head and face of an animal is cut, there follows congestion of the blood-vessels with augmented heat over the whole surface supplied by the nerve. The ear is seen to become redder; a thermometer inserted in the nostril shows an increase of temperature, the sign of a greater quantity of blood flowing into the capillaries. The inference from the experiment is, that, from the withdrawal of a counterpoise, the force that *distends* the small blood-vessels—that is to say, the heart's action—has an unusual predominance. It is further proved that this nervous influence, acting upon the minute muscular fibres of the small vessels, proceeds from the nerve-centres lodged in the head, for, by cutting the connection between the brain and the ganglion in the neck, from which the above-mentioned nerve is derived, the same restraining influence is arrested, and the congestion takes place. By stimulating the divided nerve galvanically, the suffusion disappears, the vessels shrinking by the galvanic contraction of their muscular coats.

The agency now described is of a piece with the action of the brain upon involuntary muscles generally, as the heart and the intestinal canal, and by it many organic functions—digestion, nutrition, absorption, etc.—are affected by those changes in the cerebral substance that accompany mental states. It is known that mental excitement has an immediate influence in all those functions; one set of passions, such as fear, tends to derange them, while joy and exhilaration operate favorably upon them.

To apply these observations to the case in hand: suppose that to a person in the average mental condition, something occurs which gives a painful shock; or even an uncertain stir, to the feelings—a piece of ill news, a reproach from some one whose good opinion is much valued, an open shame, or the fear of it, a fit of remorse, an occasion of grief—the pain is accompanied with a sudden loss, or waste, or decrease of cerebral power; none of the functions that the brain aids in maintaining is so strongly stimulated as before; and in particular, that stream of nervous energy which balances the heart's action in regulating the distension of the small blood-vessels, is abated, the abatement being made apparent in the redness and heat over the face and neck. In a great stroke of mental

BLUSTER—BLYDEN.

depression, the influence is of a much more extensive kind, though still of the same nature essentially as regards the enfeeblement of the nervous energy, and may lower the action of the heart itself; in which case there will be a widespread pallor, perhaps without a blush. In all probability, it is when the loss of cerebral influence extends only to the relaxation of the muscular fibres of the small vessels, leaving the heart in its usual vigor, that the state of B. is most fully manifested. A further theory is that the fulness of blood in the brain, caused by mental excitement, is relieved by blushing; as also the flush in mental work.

It is said that, in the Circassian slave market, a young woman that blushes fetches a higher price. Some complexions do not show the increased flow of blood in this way, and all persons are not equally sensitive to the cerebral shock that causes it.

BLUSTER, n. *blūs'tér* [Gael. *bladhastair*, a blusterer, a bully—from *blad*, an abusive mouth: Bav. *blasten* or *blaustern*, to snuff, to be out of temper: Icel. *blástr*, a blast]: violent puffs; noise, tumult; irregular noise from idle boasting and vainglorious talk; swagger; fitful gusts of wind: V. to blow in puffs; to be loud and noisy in talking; to puff; to bully; to swagger. **BLUS'TERING**, imp.: ADJ. noisy; boastful; windy: N. much noise; tumult. **BLUS'TERED**, pp. *-térđ*. **BLUS'TERER**, n. one who. **BLUS'TERINGLY**, ad. *-lĩ*.

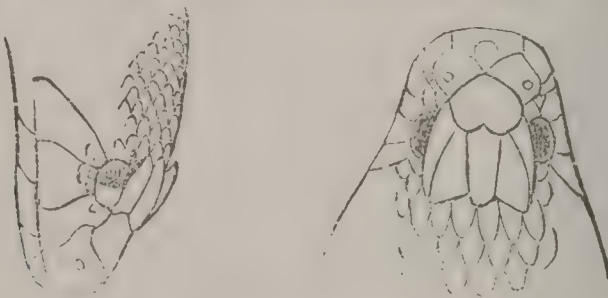
BLUTEAU, *blü-tō'*, DOM RAPHAEL: 1638–1734; b. London: Portuguese lexicographer of French extraction. After completing his studies in England, he became preacher to Henrietta Maria, queen of Charles I. He returned to Portugal, then to Paris, and finally established himself at Lisbon, where he was elected member of the Acad. Being thoroughly acquainted with the Portuguese language, he published an excellent Portuguese-Latin dictionary, *Vocabulario portuguez e latino*, etc. (1712–21, 8 vols., folio), with 2 vols. of supplement, and preceded by 50 prefaces for so many different classes of readers.

BLYDEN, *blĩ'děn*, EDWARD WILMOT: Presbyterian clergyman, an author and educator: 1832, Aug. 3———; b. in St. Thomas, West Indies; of pure negro blood. Seeking an education, he came to New York 1845, hoping to enter some American college; but found too strong a public sentiment against allowing to negroes any such opportunity, and was glad to accept from the New York Colonization Soc. a free passage to Liberia. There, in the Alexander High School, he gained a classical education, and soon after his graduation 1858 he became its principal. His linguistic attainments were remarkable: at the age of 10 he acquired Spanish; later he learned Latin, Greek, and Hebrew; afterward French and Italian; and he began the study of Arabic 1876, further prosecuting it in a journey to eastern lands. In Liberia he has been Presb. pastor, prof. and pres. of Liberia Coll., editor (at the age of 19) of the *Liberia Herald*, sec. of state and of the interior, and twice Liberian minister to Great Britain.

BOA.

BOA, n. *bō'ă* [It. *boa* or *bora*, any filthy mud, a venomous serpent that lives in mud: L. *boa*, plu. *boæ*, serpents of immense size—said to be from *bos*, an ox, in allusion to the great size of the animal]: general name for the largest kind of serpents; a fur cravat for the neck. **BOA-CONSTRICTOR**, n. *-kōn-strīk'tēr*, a powerful boa, a native of S. America. *Note*.—*Boa*, one anc. authority says, is so named because supposed to suck the milk from cows, and according to another, because it swallows cattle entire.

BO'A: in popular language, the name of all those large serpents which kill their prey by entwining themselves around it, and constricting it in their coils; but by zoologists of the present day, limited as the name of a genus to a very small portion of their number, all of which are natives of the warm parts of America—the similar large serpents of Asia and Africa forming the genus *Python* (q.v.). The name *B.*, however, was certainly not originally applied to American serpents, for it is used by Pliny, who accounts for its origin by a fable of serpents sucking the milk of cows, thus referring it, very improbably, to the Latin *bos*, an ox. The Linnæan genus *B.* comprehended all serpents having simple subcaudal plates, but without



Head of Boa.

spur or rattle at the end of the tail, and was thus very artificial, as founded chiefly upon a single unimportant character, and consisted of a very miscellaneous assemblage of species, venomous and non-venomous. The *B.* family, or *Boïdæ*, as now constituted (containing the *Pythons*, etc., of the old world, as well as the true *Boas* of the new), is almost exclusively confined to tropical climates, and all the species are of large size and great strength, some of them far exceeding in these respects all other serpents. The story related by the ancients of a serpent 120 ft. in length, which devoured several soldiers, and caused alarm to a Roman army in Africa, may be deemed unworthy of credit, although the skin is said to have been long preserved at Rome; but there is good reason to believe that serpents in more modern times have attained at least half this length and have made even the larger mammalia, and sometimes man, their prey. The *Boïdæ* are not venomous; but their mouth, although destitute of poison-fangs, is so furnished with teeth as to make their bite very severe. Their teeth are numerous, long, and directed backward, so as the more effectually to prevent the escape of the prey, which is first seized by the mouth, and then the serpent, with a rapidity of motion which the eye of the closest observer fails per-

fectly to follow, coils itself around it; the powerful muscles of the body are afterward brought into action to compress it, so that usually in a few minutes its life is extinct, and its bones are broken. Deglutition then takes place—not, as has been alleged, after the prey has been licked and covered with saliva by the tongue, but accompanied with an extraordinary flow of saliva, which seems not only to serve for lubrication, but to have the property of hastening the decomposition of animal substances, and so to assist in making the prey more easy to be swallowed. It is always swallowed entire, and the process is sometimes rather a tedious one, and seems to require no small muscular effort; but the muscles of the serpent are capable of acting for this purpose, even at the neck, when that usually narrowest part of the body is distended to an enormous degree as the prey passes through it. The lower jaw is not simply articulated to the skull, but by the intervention of other bones, a structure without which the prodigious dilatation of the throat would be impossible. The lungs consist of two lobes, one much larger than the other, and at the extremity of the larger is an extremely capacious air-bag, which is supposed to serve for the necessary aëration of the blood while respiration is impeded in the process of deglutition.

The tail in all the *Boïde* has great prehensile power, and its grasp of a tree round which it may be coiled is aided by the opposing action of two claws, one on each side of the anus, which are really the representatives of the hinder limbs of the superior vertebrate animals, and which, on dissection, are found to be connected not only with strong muscles, but with bones entirely concealed within the serpent, one jointed to another, so as to make the character of a rudimentary limb very apparent. These serpents, being almost all inhabitants of watery places, often lie in wait for animals that come to drink; thus the largest of the American species, *Boa* (*Eunectes*) *murina*—sometimes called Anaconda, although Anaconda seemed to be originally, like B., the name of a serpent of the old world—is to be found where rivers or narrow lagoons are overshadowed by gloomy forests. Perhaps the want of sufficient supplies of water, more than the greater cold of the climate, may account for the short time that specimens of the *Boïde* brought to Europe have generally lived in confinement.

After a repast, these serpents spend a considerable time in a state of comparative torpidity—several weeks generally clapsing before they waken to require a new supply—and in this lethargic state they are easily killed. When they do waken, the demands of appetite seem to be very urgent. Some interest was excited some years ago concerning a B. in the London Zoological Gardens, which, to the astonishment of its keepers, swallowed its rug; but this, after a trial of a week or two, it found indigestible, and the animal then gratified public curiosity by a reversal of the process of deglutition.



Claw of
Boa.

The head in the *Boïdæ* is thick, yet somewhat elongated; the eyes are small; the body is thickest in the middle; the tail usually has a blunt termination. The scales are numerous and rather small. The colors are various, and in many of the species rather bright and elegantly disposed. The true boas have the plates underneath the tail single, while in the pythons they are double. The species to which the name *Boa Constrictor* is appropriated is far from being one of the largest, seldom attaining a length of more than 12 ft. It is common in Surinam and Brazil, where its skin is used for making boots and saddle-cloths. The name *Boa Constrictor* is, however, popularly extended to almost any of the species.—The number of species, whether in the genus or in the family, is far from being well ascertained.

Boas are much infested by intestinal worms, which appear often to cause their death. The excrement of the B.—the urine and fæces being combined as in other reptiles, and voided by a single vent—is a solid white substance, and consists mainly of urate of ammonia, accompanied by phosphate of lime (bone-earth). It is employed as an easy source of uric acid.

BOADICEA, *bo-ad-î-sē'a*: warrior-queen of the Iceni, a tribe inhabiting the e. coast of Britain, in the time of the Romans. She lived after the middle of the 1st c. Prasutagus, her husband, who died A.D. 60, or 61, had left his wealth jointly to the Roman Emperor Nero and to his two daughters, hoping that by this artifice his kingdom would be protected from oppression; but the Roman soldiery, taking advantage of the defenseless condition of the country, began to plunder unscrupulously. B. herself was scourged, her daughters were violated, and the noblest among the Iceni were treated as slaves. These outrages soon drove the Britons to revenge. B. gathered round her a large army; attacked and captured the Roman colony of Camalodunum; defeated Petilius Cerealis, legate of the ninth legion, who was marching to its relief; took Londinium and Verulamium; and destroyed, it is said, about 70,000 Romans, many of them by torture. Suetonius, the Roman governor of Britain, now advanced at the head of 10,000 men against B., who, we are informed, had under her command no less than 263,000. A dreadful battle ensued (A.D. 62) in which, according to Tacitus, 80,000 Britons perished, and only 400 Romans. These figures, of course, cannot be trusted; but the victory must have been decisive, as it finally established the authority of the Romans in Britain. B., overwhelmed with despair, committed suicide.

BOAR, n. *bōr* [AS. *bar*; Dut. *beer*, a boar: L. *aper*, a wild boar]: the male *swine*; fem. *sow*. BOAR'ISH, a. like a boar. BOAR-FISH, a sea-fish, something like a John dory.

BOARD, n. *bōrd* [Gael. and AS. *bord*; Icel. *bord*; Dut. *berd*; Ger. *brett*, a board or plank: Dut. *boord*, a margin or border]: a slab or flat piece of wood sawn from a log; a table; food or diet; a council, or meeting of managers con-

BOARD—BOARDING.

vened for business; the deck of a ship. **BOARDS**, *n. plu.* *bōrdz*, planks; the covers of a book: the line over which a ship runs between tack and tack. **BOARD**, *v.* to cover with flat pieces of wood; to enter a ship by force; to furnish with food and lodging for a price; to lodge; in *OE.*, to attack; to accost [*F. aborder*, to touch, to attack]. **BOARDING**, *imp.* **BOARD'ED**, *pp. a.* **PASTEBOARD**, layers of paper pasted together to make a board. **BOARD'ER**, *n.* one furnished with food at a price; one who boards a ship in action. **BOARD'ABLE**, *a.* *-ā-bl'*, that may be boarded. **TO FALL OVERBOARD**, to fall over a ship's side. **THE WEATHER BOARD**, the side of a ship which is to windward. **BOARD-RULE**, a figured scale for finding the number of sq. ft. in a board without a formal calculation. **BOARDING-HOUSE**, a house in which persons are provided with lodging and food for a price. **BOARD-WAGES**, money given to servants when they provide food for themselves. **BOARDING-NETTINGS**, strong cord nettings designed to prevent a ship from being boarded in battle. **BOARDING-PIKE**, a weapon used by sailors in boarding an enemy's ship. **TO MAKE SHORT BOARDS**, to tack frequently. **SEA-BOARD**, the border or margin of the sea. **STARBOARD**, right-hand side. **LARBOARD**, the left hand side; port: see **LARBOARD**: **STARBOARD**. **BOARDING-SCHOOL**, a school where the pupils are lodged, educated, and provided with food for a price. **ON BOARD**, in a ship. **BED AND BOARD**, sleeping accommodation and victuals at table. **IN BOARDS**, in pasteboard sides and paper covers, applied to the binding of a book, in contradistinction to one covered with cloth or leather. **BY THE BOARD**, over the side. **BOARD OF CONTROL**, six privy councilors formerly appointed to superintend all the affairs of the British *E. Indies*, abolished 1858. **BOARD OF TRADE**, a committee of privy council which supervises all matters connected with the commerce of the United Kingdom—*plu.* **BOARDS OF TRADE**: see **TRADE**, **BOARD OF**.

BOARD, *n.* *bōrd*, in *mining* [see **BOARD 1**]: the gallery or drift in a coal-mine cut across the face of the coal; hence the term 'board and pillar working.'

BOARD: general name for persons in their collective capacity, who have the management of some public office or department, bank, railway, charity, or indeed of any other trust. Thus, the commissioners of excise, when met for the transaction of business, are called the *B. of Excise*; directors of railways, *B. of Directors*; and in England, the lords of the treasury, the *B. of Treasury*, etc.

BOARD—BOARDING: in nautical language, having many significations. Besides the ordinary application of *board* to a plank of wood it is applied also to a space or portion of sea over which a ship passes in tacking; hence the phrases 'to make a good board,' 'to make short boards,' 'to make a stern-board,' 'to leave the land on back-board,' etc.—all of which refer to the direction of a ship's movement at a particular time and place. Again, *board* or *aboard* relates to the interior of the ship, in such phrases as 'to go aboard,' 'to heave overboard.' etc.

But the most important of these meanings is that which relates to the *boarding* of an enemy's ship, or making a forcible entry for the sake of capturing it. Whenever this bold operation is determined on, certain seamen are told off to act as boarders. It is very rarely that, between two men-of-war, this operation is ventured on; it would, in most cases, be too perilous to the assailants, who more frequently conquer by cannon and musketry. Boarding is, in most instances, attempted by privateers against merchantmen, where the defenders are few in number. The assailant well considers all the circumstances for and against him—the relative sizes of the two vessels, the relative strength of the crews, the state of the wind and sea, and the chances of escape if foiled. Besides the pistols, cutlasses, and boarding-pikes of the seamen, there are provided powder-flasks for producing smoke and confusion on the enemy's deck, and shells called stink-pots, for producing an intolerable stench. The moment and the spot being selected, the fuses of the flasks and stink-pots are lighted; these combustibles are thrown upon the enemy's deck; and while the fire, smoke, and stench are doing their work by confusing the enemy, the boarders climb on board, and gain a mastery by their personal prowess—that is, if the calculations of relative strength have been duly made. Sometimes terrible hand-to-hand encounters take place on deck before victory decides for or against the assailants.

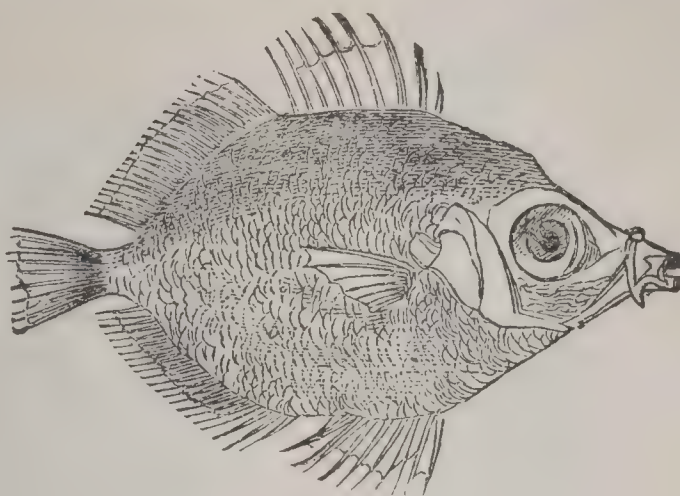
BOARDMAN, *bōrd'man*, GEORGE DANA: Baptist missionary in Burma: 1801, Feb. 8—1831, Feb. 11; b. Livermore, Me. He graduated at the college in Waterville, Me., 1822, and at Andover Theol. Sem.; and was ordained a Bapt. minister 1825, Feb. 16. Having devoted himself to missionary work, he went to Calcutta 1825, studied the Burmese language, and organized 1827, May, a mission at Maulmain, in Burma, which became the nucleus of the extensive and successful Bapt. missions in that country. He was successful, but his unremitting labors caused his early death. His widow married Adoniram Judson, D.D. (q.v.)

BOARDMAN, GEORGE DANA, D.D., LL.D.: Baptist minister: 1828, Aug. 18—1903, Apr. 28; b. Tavoy, Burma; son of George D. B., missionary to Burma, and step-son of Adoniram Judson, D.D. (q.v.). He graduated at Brown Univ. 1852, and at Newton Theol. Institution, Mass., 1855; and became pastor at Barnwell, S. C.; but the slavery question soon (1856) caused his acceptance of the pastorate of the 2d Bapt. Chh. in Rochester, N. Y., whence he removed 1864 to the 1st Bapt. Chh. in Philadelphia. He gained wide repute as a writer; among his many books are *Studies in the Creative Week* (1878); *Studies in the Model Prayer* (1879); *Epiphanies of the Risen Lord* (1879); *The Mountain Instruction* (1880); *The Divine Man* (1887). Many of these, delivered as lectures, drew great audiences.

BOAR'-FISH (*Capros*): genus of fishes of the Dory (q.v.) family, or *Zeïdæ*, differing from the genus *Zeus*, or Dory, in the still more protractile mouth—the resemblance of which to the snout of a hog is supposed to have given origin to the name—in the want of spines at the base of the

BOAR'S HEAD.

dorsal and anal fins, and of long filaments to the dorsal spines. The body has the usual oval, much compressed form of the family. The common B. (*C. Aper*) is a well-known inhabitant of the Mediterranean, rarely caught on



Boar Fish (*C. Aper*).

the coasts of England. The eyes are very large, and placed far forward; the body is of a carmine color, lighter below, and with seven transverse orange bands on the back. The flesh is little esteemed.

BOAR'S HEAD: the subject of a variety of legends, poetic allusions, and carols connected with the festivities of Christmas in England: see CHRISTMAS. At this wintry season, the wild boar was hunted, and his head served up as the most important dish on the baronial table. According to Scott's graphic lines:

Then was brought in the lusty brawn
By blue-coated serving-man;
Then the grim boar's head frowned on high,
Crested with bays and rosemary.
Well can the green-garbed ranger tell,
How, when, and where the monster fell;
What dogs before his death he tore,
And all the baiting of the boar.

In the 'boar's-head carols' are found some of the most interesting specimens of the old English convivial verses. The following, from a carol printed by Wynkin de Worde (1521), may be given:

*Caput Apri defero
Reddens laudes Domino.*

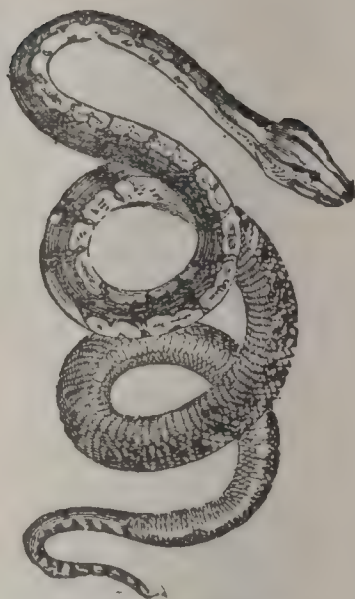
The boar's head in hand bring I,
With garland gay and rosemary;
I pray you all sing merrily
Qui estis in convivio.

The boar's head, I understand,
Is the chief service in this land;
Look wherever it be found,
Servite cum cantico.

The boar's head 'crased,' according to heraldic phraseology, is a well-known cognizance of a number of old families, particularly the Gordons; it also formed the sign of a tavern at Eastcheap, London, which has been inamor



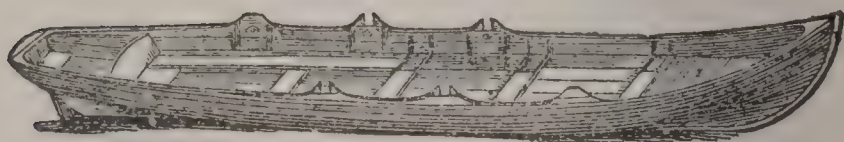
Head of Boa.



Boa Constrictor.



Wild Boar.



Boat.—Thames Wherry.

BOAST—BOAT.

talized by Shakespeare. On the site of this famed tavern now stands the statue of William IV.

BOAST, v. *bōst* [Ger. *pausten*, to swell the cheeks: W. *bost*, a bragging: Dut. *poſ*, the sound of a blow; *poſſen*, to puff, to brag: Scot. *boost*, the crack made by bursting open—Gael. *bosd*, to boast—*lit.*, to give a crack or loud sound, implying emptiness]: to speak in high praise of one's self; to speak in exulting language of another; to brag; to vaunt: N. a brag; self praise or commendation; occasion of exultation; exaggerated or ostentatious expression. **BOAST'ING**, imp.: **ADJ.** ostentatious in words; glorying; vaunting: N. the act of boasting. **BOAST'ED**, pp. **BOAST'INGLY**, ad. *-lī* **BOASTER**, n. one who. **BOAST'FUL**, a. *-fūl*, given to boasting. **BOAST'FULLY**, ad. *-lī*. **BOAST'FULNESS**, n. **BOAST'ING**, n. [F. *ebaucher*]: the paring of stones by stone-cutters with the broad chisel; the blocking out a piece of stone or wood to form a rude approach to the ultimate figure; among *carvers*, the rough cutting round the ornaments, to reduce the whole to their proper contour or outlines.—**SYN.** of 'boast, v.': to vaunt; bluster; brag; crow; vapor; glory;—of 'boast, n.' and 'boasting, n.': brag; vaunt; vaunting; glorying; ostentation; swagger; swaggering; gasconade; rhodomontade; vapping; bluster; parade.

BOAT, n. *bōt* [AS. *bat*; Dut. *boot*; Icel. *batr*; F. *bateau*, a boat: Gael. *bāta*, a boat: Gael. and Ir. *bata*, a staff, a stick]: a small open vessel for sailing on water: V. to sail in a boat. **BOAT'ING**, imp.: N. sailing or rowing in a boat. **BOAT'ED**, pp. **BOAT-HOOK**, n. a long pole hooked with iron to pull or push a boat. **BOAT-SHAPED**, a. in appearance like a boat. **BOAT-FLY**, an insect, so called from swimming in water on its back. **IN THE SAME BOAT**, treated alike: placed in the same circumstances. **BOAT-SHELL**, the English name of the shell ranked under the genus *Cymba* (q.v.). **BOAT-BILL**, a S. Amer. bird with a large and extraordinary beak.

BOAT: general name for a small open vessel for navigation; sometimes applied also to large vessels, as steam-boats. The kinds are very numerous. The chief varieties supplied to large ships are the following:—*Long-B.*: the largest B. of a ship, furnished with mast and sails; it is either armed and equipped, to render warlike service in certain situations, or it is employed to fetch water, wood, provisions, and heavy stores on board. *Launch*: longer and more flat-bottomed than the long-B.; being rowed with a greater number of oars, it makes more rapid progress up rivers. *Barge*: a long, narrow, light B., employed in carrying the principal officers to and from the ship: for other kinds of boats or vessels under this name, see **BARGE**. *Pinnace*: a B. for the accommodation of the inferior officers; it has usually eight oars, whereas the barge has ten or more. *Cutter*: broader, deeper, and shorter than the barge or pinnace; it is rowed with six oars, sometimes hoisting a sail, and is chiefly employed in carrying light stores, provisions, and crew. *Jolly-B.*: a smaller cutter, rowed with four oars instead of six. *Yawl*: small in size, and used

for nearly the same purpose, as cutters and jolly-boats. *Gig*: a long narrow B., rowed with six or eight oars, and employed by the chief officer on expeditions requiring speed. Some of the aboriginal boats are diagonal-built for strength; the others are clincher-built, to be as light as possible.

A great variety of boats are in use on our maritime and lacustrine coasts. After the raft, the first idea of a boat probably took the shape of the canoe, or dugout, made from a log of wood, hollowed out by fire and tools, and shaped to as good a model as practicable (see CANOE). The Catamaran, made of three logs fastened together side by side, is another approach to the boat. The primitive boat, Coracle, still in use on the British islands, has a framework almost circular, over which a waterproof covering is stretched. This tub-like craft is worked with much skill by a paddle. Modern boats are usually of wood. A frame consisting of keel and ribs lying in planes at right angles thereto is first set up, and to this the planks are secured, in general longitudinally, by wooden pins, nails, or rivets. The planks may be laid edge to edge (carvel-built—see CARVEL), or the lower edge of each plank may lap over the upper edge of the next (Clincher-built—q.v.). Sometimes two layers of planking are used. One set is fastened over the other, breaking joints so as to give a double thickness. Varnish or oil is applied between the two layers. Another system dispenses with ribs. Thin wood, in two or three layers crossing each other diagonally, acts as skin and as frame. Sometimes iron, corrugated in the general direction of the seams, is used to cover the ribs. Paper boats are covered with sheets of paper laid on a model of the exact shape of the interior of the boat: the sheets are laid on so as to break joints. They are secured and made watertight by varnish and oil. A recent material suggested for the outside covering of boats is sheet aluminium. The covering of boats is often termed the skin.

In shape, the simplest type of boat is the punt, or scow, flat-bottomed, with square ends. In the next advance the bow is made sharp, giving the batteau, called sometimes sharpie, skiff, or flattie. In advance of these are the oyster and sea-skiffs of the N. J. and L. I. coasts. These have flat bottoms with rounded sides, sharp bow, and overhanging flat stern. They are excellent sea-boats, and their model has been adopted for the boats in the life-saving service of the Atlantic coast (see LIFE-BOAT). The Norwegian skiffs are of much the same type, but very heavily built, with almost semi-circular cross section, and are put together with wooden pins (tree-nails). The whale-boat, a development of the whaling industry of New Bedford and Nantucket and elsewhere, is double-ended, with very fine model, and so celebrated for good qualities that it has been adopted in the U. S. navy. A whale-boat rescued one of the parties escaping from the sunken *Jeannette*, off the coast of Siberia. On ships, the boats, according to their size and characteristics, are designated long-boat, launch, pinnace, dingy, Life-boat (q.v.), etc.

BOATBILL—BOAT-FLY.

The racing and exercise boats are simply developments of the working craft: they are very narrow and long. To give the oars sufficient bearing, the row-locks are sometimes carried on brackets, projecting from the sides, called outriggers (see *plate*). A racing boat, termed 'shell,' for one man may weigh only 30 lbs. The English coble (see *plate*), is characterized by a flat floor or bottom at the after end, while the rudder projects far below the hull. On reaching shore the rudder is unshipped and the boat is beached stern first. The plate shows also the wherry, a celebrated English river-boat, and the randan gig, which is rowed by three men, the centre man with two oars, the others with one oar apiece.

BOATBILL (*Cancroma cochlearia*): bird of the Heron (q.v.) family, the only known species of a genus differing from the true herons in little else than the form of the bill,



Boatbill (*Cancroma cochlearia*).

which is comparatively short, and very broad, the mandibles resembling the bowls of two spoons placed one upon the other, the upper mandible overlapping the lower, keeled on its upper ridge, and hooked at the point. The B. is about the size of a domestic fowl, has shorter limbs than most of the herons, but resembles them in plumage, and is abundantly provided with elongated feathers on the back of the head and neck, which it erects when irritated. Its general color is rusty red, the forehead and breast whitish. It inhabits Cayenne, Surinam, Brazil, etc., sits perched upon trees which hang over streams, and darts down upon fish, which seem its principal food.

BOAT-FLY (*Notonecta*): genus of insects of the order Hemiptera (q.v.), sub-order Heteroptera, and of the family of the *Hydrocorisæ*, or Water-bugs (q.v.). All of them, like the rest of the family, are aquatic. Their English name is derived from their boat-like form, eminently adapted for

BOATING.

progression in water, and probably also from their remarkable habit of always swimming on their back—peculiar to the genus *Notonecta*, as restricted by recent entomologists—and of resting in this posture suspended at the surface of the water. The known species of this genus are not numerous. One of them, *N. glauca* (sometimes called the *Water Boatman*), is about half an inch long, and varies considerably in color; but exhibits a general greenish tinge, the other colors being black, brown, and gray. They fly well, but seldom use their wings. They move with difficulty on dry ground. When they descend into the water, they carry down a supply of air for respiration in a hollow between their folded wings. They feed on animal substances, and often kill and devour their own species. *N. undulata* is very common in the United States.



Water Boatman
(*N. glauca*).

BOATING: art or business of managing and propelling a boat by hand-power, or sails, or steam: for the last two, see **YACHT: STEAM-NAVIGATION**. The coracle (see **BOAT**), is managed with a single paddle. The row-boat is moved by oars in pairs; when there is but one oarsman he works an oar in each hand. The rower sits usually with his back to the bow, so that his progress is backward. Sometimes, in deeper boats, the rower stands in the bottom, facing the bow, and operates one or two oars. When several rowers propel a boat, each one may have a pair of oars or only a single oar. There is an advantage in having the same number of oars on each side; but this is often dispensed with—an excess of one oar not being objected to. A peculiar distribution of oars is used in the randan skiff (see **BOAT**). The steering, if executed by the rowers, is effected by their ‘pulling’ harder on one side than on the other, or by one side ceasing rowing. The rower nearest the bow is supposed to direct the steering. Often a regular rudder or steering oar projecting over the stern is used, when the rowers simply propel, without steering, the boat. It backing water, the motion of the oars is reversed, so as to send the boat stern forward. Another way of propelling a boat is by sculling. An oar is thrust out over the stern and worked somewhat like the tail of a fish. Being moved to and fro across the path or wake of the boat, and its blade being inclined, it acts somewhat like a screw-propeller. The Venetian gondola is propelled by one oar, with a sort of compromise between rowing and sculling. Boats are propelled sometimes by long poles: these are put down to the bottom, and the boatman pushes the boat along as far as he can, and then recovers his pole and starts anew for a second push. He may in doing this walk the entire length of the boat, back and forth, as he pushes and recovers. The English term this ‘punting’: it is a favorite form of pleasure boating on the upper reaches of the Thames. Sails are often used on row-boats. As a shallow round-bottomed boat cannot go to windward, it is usual to employ a flat-board projecting down from the lee beam (a lee-board) to prevent drifting

BOAT-LOWERING APPARATUS—BOATSWAIN.

or making lee-way; or the boat may be fitted with a centreboard for the same purpose. For row-boats and canoes, special folding centreboards are made which dispense with the cumbersome trunk of the old-fashioned centreboard. Instead of either of these, a piece of board is sometimes permanently fixed to the keel, projecting downward six inches or more: it is termed a rocker.

In racing boats propelled by oars the use of the sliding seat is now universal. This is a board free to move back and forth on rollers. The rower sits on this, and as he pulls, pushes it toward the bow, and as he recovers, draws it sternward again: this adds to the power of his stroke. The motion of the sliding seat is effected by the legs, the feet being strapped to a foot-board. This gives the legs more work to do than they have in ordinary rowing.—For Boat-racing in this country and in England, see ROWING.

BOAT-LOWERING APPARATUS: frames, ropes, and pulleys for lowering boats from ships quickly and safely, in emergency. Every passenger-ship is compelled by law to carry a certain number of boats, depending on the tonnage; and every ship of war necessarily carries boats (see **BOAT**) for minor services. In lowering boats from a ship in a sea-way, the use of ordinary tackle is attended with inconvenience and danger. It consisted in the use of a block and fall at each end of the boat, by which it was suspended from curved arms termed *davits*. It was lowered to the water by these, which were then unhooked. If there were waves, a failure to detach both tackles simultaneously often resulted in raising one end of the boat high out of the water, and perhaps capsizing it. Exact simultaneousness is always requisite in operating the two-end tackles in order to keep the boat level. In Clifford's apparatus, a drum or windlass is fixed in the centre of the boat. Both of the end suspension ropes are carried to this drum, and by allowing it to turn the boat can be lowered horizontally. One man at the centre thwart regulates the descent of the boat by what is termed a winding rope; and soon as the boat has been lowered, the ropes are cast off from the drum. The lowering pendants are brought by blocks to the roller. Slings or lifts hold the boat steady; the lanyard is slipped off the nooks when the boat is to be lowered. The boat, filled with her crew, can be lowered by a single man.

Other lowering apparatus takes the form of swinging davits which, counterpoised by springs or weights, swing out from the ship's side while they lower the boat.

BOATSWAIN, n. *bōt'swān* or *bō'sn* [AS. *batswan*—from *bāt*, a boat; *swān*, a rustic, a servant (see **SWAIN**)]: a ship's officer who has charge of the boats, sails, etc., and calls the crew to duty.

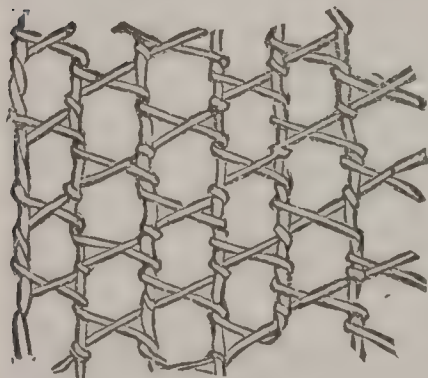
BOATSWAIN: an officer on board a ship, who has charge of the boats, sails, rigging, cables, anchors, flags, and cordage. He is immediately under the master in some of these duties; he frequently examines the masts and yards, sails and ropes, to report on their condition and

efficiency. He also keeps account of all the spare rigging etc., and superintends the replacement of old by new. The B. has certain duties in connection with the crew; he calls them to duty, and assists in the necessary business of the ship, and in relieving the watch. In bad weather, he looks well to the boats and anchors, especially when night is coming on. A B. should be a good sailor, a good rigger, and a vigilant, sober, firm man.

The *boatswain's mate* assists in all the above-named duties.

BOB, n. *bōb* [Gael. *babag*, a tassel: W. *bagad*, a cluster: Ger. *beben*, to shake]: any small thing playing loosely at the end of a string; the float of a fishing-line which *pops* up and down; a knot of worms on a string used in fishing for eels; a blow; in *bell-ringing*, a peal of several sets of changes, as a 'bob-major' or a 'bob-minor': V. to play loosely against anything; to mock; to dangle; to dance up and down; to fish with a bob for eels; in *OE.*, to flap; to gain by fraud: to deceive. BOB'BING, imp.: ADJ. hanging as a bob; swinging backward and forward with a small weight at the end. BOBBED, pp. *bōbd*. BOBBIN, n. *bōb'bin*, [F. *bobine*, a pin for wrapping silk or thread round]: a round pin with a head on which silk or thread is wound; a little knob hanging by a piece of thread, used in lace-making. BOBBINET, n. *bōb'bi-nēt'*, a kind of lace wrought in machines. BOB-CHERRY, n. a game among children in which a cherry is so hung as to bob against the mouth. The little player tries by jumping up to seize it with the teeth, without using the hands. BOBSTAY, n. *bōb'stā*, a rope used to confine the bowsprit to the stem. BOBTAIL, n. *bōb'tāl*, a tail cut short; the rabble, in contempt—as *tag-rag and bobtail*. BOB'TAILED, a. having the tail cut short. BOB'WIG, n. a short wig.

BOBBINET', or BOB'BIN-NET: a kind of net-fabric usually made of cotton-thread. It is of the nature of lace, but is made in the lace-frame instead of by hand. The texture consists in the interlacing of a set of long threads, representing the warp in common weaving, with a set of cross-ones (the weft), in such a manner as to form a mesh-texture. The chief seat of B. manufacture in Britain is Nottingham. See LACE MANUFACTURE.



Bobbinet texture.

BOB'BINS: small wooden rollers, flanged at the ends, and bored through the centre lengthwise, so that they can be placed on a spindle or skewer. The bobbin on which ordinary sewing-thread is wound, although generally of small size, is a good example of their prevailing shape. One or two kinds are, however, of a different type; thus the bobbin, called in Scotland *pirn*, for delivering the weft from the shuttle, is simply a tapered pin, bored it may be

BOBBIN-WORK—BÖBLINGER.

throughout, with but the rudiments of a flange at the thick end; and the bobbin used for a similar purpose in lace-weaving is merely a thin metal pulley, about the size of a halfpenny. For the machines used in the various spinning processes of the textile industries—namely, the slubbing, the roving, the drawing, and spinning frames, bobbins of various sizes, and in enormous numbers, are required. Some of these are 15 inches long by 5 inches in diameter, and diminish in size for each succeeding process, those for the spun yarn being scarcely larger than a good-sized thread-bobbin. There are also winding and warping bobbins for the weaving processes. For some purposes paper tubes have of late years superseded bobbins.

We are so familiar with the neat and convenient thread-bobbin, now seen in every house, that we are apt to think it a very old invention. Yet as late as the last quarter of the 18th c., all the sewing-thread used for domestic purposes was wound in the form of balls.

In the making of thread-bobbins, ingenious automatic machinery is now employed. Transverse slices of common birch, the wood chiefly used for these, are first cut to the length of the bobbins. From each of these a number of circular bobbin blanks are next cut out by an annular saw, a hole being drilled through the centre of each at the same time. These blanks are then fed into a self-acting turning-machine, operating with a compound cutting tool, whose form is the reverse of the profile of the bobbin. One of these machines produces from 80 to 100 gross of bobbins per day, while an expert hand-turner could not produce more than eight gross in the same time. As most of the bobbins required for spinning purposes are larger than those required for thread, they are made by turning the barrels and ends separately, and then gluing them together in order to save wood.

Bobbins are made of various kinds of wood, but principally of birch, beech, ash, and plane tree. Sometimes two kinds are used in the same bobbin; and for some special purposes, bobbins are made entirely of metal, such as iron or tin-plate. A prodigious number of bobbins is constantly wanted to supply the wear of those used in the spinning processes.

BOBBIN-WORK, *n.*: work woven with bobbins.

BOBBIO, *bōb'bē-ō*: town in *n.* Italy, province of Pavia; near the left flank of the Trebbia, about 37 m. *n.e.* of Genoa. B. is an ancient place, having originated from a church and convent erected here in the end of the 6th, or beginning of the 7th c., in the crypt of which St. Columbanus and some of his disciples were buried. B. has a cathedral, an episcopal palace, and a palace belonging to the Malaspina family. It is guarded from the inundations of the Pellice by a long embankment, built by a money-grant from Oliver Cromwell, during whose protectorate the town was nearly destroyed by an inundation. Pop. abt. 4,000.

BÖBLINGER, *bōb'ling-ēr*, MATTHIAS: architect: d. 1505;

BOBOLINK—BOCA.

b. Altbach, near Esslingen, Württemberg. He was employed on the minster at Ulm 1474, and became architect of that structure 1480. He went to Frankfort 1483, whither he was invited to direct the work on the cathedral tower. When (1492) the tower of the Ulm minster, after it had been carried to the height of 237 ft., threatened to fall, B. fled from the indignant people. He went to Esslingen 1496.

BOBOLINK, or BOBLINK, or REED BIRD, or RICE BIRD (*Dolichonyx oryzivorus*): bird with bill like the buntings and sparrows, but of a genus characterized by stiff-pointed tail-feathers. It is rather larger than a yellow-hammer; and the male in his summer or nuptial plumage exhibits a fine contrast of colors, black, yellow, and white. The female differs greatly from the male in colors of plumage, yellowish-brown chiefly prevailing; and in the latter part of summer, the males assume the comparatively dull hues of the females. The B. is a bird of passage, spending the winter in the West Indies. In summer it is found as far n. as the banks of the Saskatchewan, lat. 54°, but is most plentiful in the Atlantic states and other e. parts of America, where it is common in meadows and cornfields. It renders good service by the destruction of insects and their larvæ; but the immense flocks which congregate on their return southward in autumn commit great ravages in the rice-plantations of Carolina. At this season these birds become extremely fat, and are killed in great numbers for the table. Their flesh is delicate, and resembles that of the ortolan.

The B. generally makes its nest in a grassy meadow, an artless structure of a few dry stalks and leaves, with a lining of finer grass. It displays the same instinct with many other birds, of seeking to lead intruders away from its nest, by pretending great anxiety about some other part of the field. During the breeding-season, the males are very musical, singing mostly in the air, in which they seem to rise and fall in successive jerks. Their song is very pleasing, and is 'emitted with a volubility bordering on the burlesque.' On account of their beauty and powers of song, many are caught, caged, and sold in the New York and other markets.

BOBRUÏSK, *bo-brô-isk'*. fortified town of Russia, in the govt. of Minsk; 88 m. s.e. of the city of Minsk. It is on the right bank of the Beresina, and is a station for the steam-packets navigating the Dnieper and Beresina. It was besieged ineffectually by the French, 1812. Pop. (1880) 26,870; (1887) 58,356.

BOCA, *bo'ká* [Span. meaning *mouth*]: term applied to the entrance of various straits and rivers, chiefly in America.—1. B. *Chica*, the chanel of 28 m. in length, which leads to Cartagena in New Granada.—2. B. *de Navios*, the largest and most southerly outlet of the Orinoco.—3. B. *Grande*, bay of the Caribbean Sea, at the mouth of the Zucar, in Costa Rica.—4. B. *del Toro*, on the Caribbean Sea, in Costa Rica, lat. 9° 20' n., long. 82° w.



Boat.—Coble.



Bobolink.



Boat.—A, Transom; B, Stern-post; C, Keel.



Boat.—Thames Randa Skiff.

BOCASINE—BOCCACCIO.

BOCASINE, n. *b'k'a sîn* [F. *boucassin*]: a kind of calamanco or woollen stuff; a fine buckram.

BOCCACCIO, *bo-kat'cho*, GIOVANNI: 1313-1375, Dec. 21; b. Paris: author of the *Decamerone*. He styled himself *Da Certaldo*, and was sometimes named *Il Certaldese* by others, because his family sprang from Certaldo, a village in the Florentine territory. From an early period he showed a taste for poetry, which his father attempted to thwart; but as soon as B. had attained his majority he began poetizing both in Italian and in Latin, but not with any 'fine issues.' In prose he succeeded far better, developing quickly that airy grace of style which suits so admirably his light and lively tales, and which soon placed him in the highest rank of Italian prose-writers. He studied Dante closely, but did not confine himself to literature properly so called. In 1350, B. formed an intimate friendship with Petrarch, and, following his friend's example, collected many books and copied rare MSS., which he could not afford to buy. It is said that he was the first Italian who ever procured from Greece a copy of the *Iliad* and the *Odyssey*. He also wrote a *Genealogy of the Gods*, in 15 books, unquestionably the most comprehensive mythological work that Europe had as yet seen. But not only was B. one of the most learned men of his time, he was also one of the most enlightened in his scholarship. He helped to give a freer direction and a greater expansiveness to knowledge, stimulated his contemporaries to the study of Greek, and wished to substitute the wisdom of antiquity for the unprofitable scholasticism that prevailed.

While in Naples (1341), B. fell passionately in love with a young lady who was generally supposed to be an illegitimate daughter of King Robert. His passion was returned, and to gratify his mistress, B. wrote *Il Filicopo*, a prose-romance, and afterward *La Teseide*, the first attempt at romantic epic poetry, and written in *ottava rima*, of which B. may be considered the inventor. In 1342, he returned to Florence, but in 1344 went back to Naples where he wrote his *Amorosa Fiammetta*, *Il Filostrato*, and *L'Amorosa Visione*. Here also he composed his famous *Decamerone*, to please Joanna, the daughter and successor of King Robert. It consists of 100 stories, ten of which are told each day by seven ladies and three gentlemen, who had fled from Florence during the frightful plague of 1348, to a country villa, and who try to banish fear by abandoning every moment to delicious gayety. It is impossible to exaggerate the literary merits of the book. In abundance of incident especially, it is almost inexhaustible, though many of the stories are taken from older collections of *Contes et Fabliaux*. It is, however, unfortunately steeped in impurity. B. once more returned to Florence about 1350. He was now honored with several diplomatic appointments by his fellow-citizens, and subsequently even thought of entering into holy orders as a penance for the immoral life he had previously led. From this artificial course of repentance he was wisely dissuaded by Petrarch, who advised him to be

BOCCA—BOCHART.

content with changing his conduct. In 1373, B. was appointed Dantean prof. at Florence; that is to say, he was to deliver elucidatory lectures on the *Divina Commedia* of the great poet, and zealously devoted himself to the difficult task thus imposed on him; but his health failing, he resigned the office, and retired to his little property at Certaldo, where he died, 16 months after his friend Petrarch. Besides the works above mentioned, B. wrote *Origine, Vita e Costumi di Dante Alighieri*, and *Commento sopra la Commedia di Dante*. This commentary on the Divine Comedy extends only to the 17th canto of the *Inferno*. In Latin, B. wrote, besides the *Genealogia Deorum*, a work arranged in alphabetical order, *De Montibus, Silvis, Fontibus, Lacubus, Fluminibus*, etc.; *De Casibus Virorum et Fœminarum Illustrium*; *De Claris Mulieribus*, etc.

BOCCA, n. *bok'ka* [It.]: the round hole in a glass-furnace from which the glass is taken out on the end of the pontil.

BOCCAGE, *bo-kazh'*, MARIE ANNE FIQUET DU: 1710, Oct. 22—1802, Aug. 8; b. Rouen, France: French poetess. She received her education in the monastery of the Assumption of Paris, where her poetic tendencies early developed themselves, though only furtively. She appeared as an authoress first in a small volume of poems, 1746; next as an imitator of Milton in her *Paradis Terrestre* (1748); and in 1756, issued her most important work, *La Colombiade*. The letters which she addressed to her sister, Madame Duperon, while travelling through England, Holland, and Italy, are the most interesting things which have fallen from her pen. During her life, she was excessively admired and bepraised, especially by Voltaire, Fontenelle, and Clairaut. She used to be described as *Formâ Venus, arte Minerva*. The complimentary poems addressed to her would, if collected, fill many volumes. She was elected member of the academies of Rome, Bologna, Padua, Lyon, and Rouen. Her poems fail to account for her former reputation, and indicate that her personal attractions must have given a charm to her verses.

BOCCA TIGRIS, *bok'kâ tē'gris*, or BOGUE: name of that portion of the estuary of the Canton river (q.v.) extending n. from lat. 22° 45' n.; s. of this point, the estuary is designated the 'Outer Waters.' In the centre of the B. T. are the rocky islands of North and South Wantung, while on the east the B. T. has the islands of Anunghoy and Chuenpee, and on the west the Ty-cock-tow island. On these islands are the Bogue forts, which have been more than once captured by the British. The last time they were taken was 1856, Nov., the occasion of quarrel being the refusal of the Chinese to make proper reparation for the capture of a vessel under British protection, but alleged by the Chinese to be nothing but a smuggling craft, contriving to hide its real character by hoisting the British flag.

BOCHART, *bo-shâr'*, SAMUEL: 1599–1667; b. Rouen, France, of an ancient family: Protestant divine. He very early showed remarkable talent, chiefly philological.

BOCHNIA—BÖCKH.

After studying at Paris, Sedan, and Saumur, visiting England, 1621, and finishing his education at Leyden, he was chosen pastor of the Protestant church at Caen, where he became very popular. In 1629, he gained great reputation by his victory, in a public discussion of several days' duration, over the famous Jesuit, Doctor Verin. The meetings gained additional éclat from the occasional presence of the Viceroy of Normandy, the Duke of Longueville. In 1646, appeared his Sacred Geography, bearing the title of *Phaleg* and *Canaan*. His *Hierozoicon*, or Scripture Zoology, to which he devoted many years of his life, appeared posthumously, 1675. In 1652, B. was invited to Stockholm by Queen Christina, and went thither accompanied by his friend Huet. The court-life, however, did not suit him, and his visit was short. He died suddenly while speaking at a meeting of the Caen Acad. of Antiquaries. A complete edition of his works, with a life by Morin, was published at Leyden, 1712; and a new improved edition of the *Hierozoicon*, his most valuable work, at Leipsic, in 3 vols. 4to (1793-96), by Rosenmüller.

BOCHNIA, *bok'ne-â*: town of Austrian Galicia, cap. of a circle of the same name; about 25 m. e.s.e. of Cracow. The houses are built chiefly of wood. There are extensive mines of rock-salt in its vicinity, which employ upward of 500 miners, and yield annually about 13,000 tons of salt. Pop. about 9,000.

BOCHUM, *böch'ôm*: town of Prussia, 35 m. n.e. from Düsseldorf by rail. Its great steel works employ over 5,000 hands and produce about 150,000 tons annually; armor-plating for ships, steel ropes and cables, machinery, safety-lamps, coal-tar, oil, and carpets are its other chief manufactures. There are valuable coal mines near by. Pop. (1900) 65,551.

BOCKELET, *bök'ël-ët*, or **BOCKEREL**, *bök'ër-el*, or **BOCK'ERET**: a kind of long-winged hawk.

BOCKENHEIM, *bök'ën-hîm*: town of Prussia, one m. n.w. of Frankfort-on-the-Main; on the Main and Weser R. R.; connected with Frankfort also by a horse-railway; has a Rom. Cath. and a Prot. church, a hospital, schools of various kinds and grades, and numerous thriving industries, including marble works, manufactures of pianofortes, jewelry, bronze-ware, iron-ware, agricultural machines, machines for making shoes, etc. Pop. (1864) 5,901; (1880) 15,396; (1891) 18,605.

BÖCKH, *bök*, **AUGUSTUS**: 1785, Nov. 24—1867, Aug. 3; b. Carlsruhe: erudite classical antiquary of Germany. He entered the Univ. of Halle, 1803. The prelections of Wolf determined him to the science of philology. His first publication was *Commentatio in Platonis qui vulgo fertur Minnoem* (Halle, 1806). In 1808, appeared his *Græcæ Tragædiæ Principum, Æschyli, Sophoclis, Euripidis, num ea quæ supersunt et genuina omnia sint*. In 1809, he became ordinary prof. at the Univ. of Heidelberg; and in 1811, he was translated to the chair of rhetoric and ancient literature at Berlin, where he taught for upward of 40 years, form-

BOCKING—BOCKLAND.

ing many excellent scholars, and extending his reputation through all the learned circles of Europe. His conception of philology as an organically constructed whole, which aims at nothing short of an intellectual reproduction of antiquity, excited for a long time great opposition among his professional contemporaries, but it undoubtedly gave an impetus to a deeper study of the old classical world. His lectures include not merely a grammatico-historical interpretation of the ancient authors, but also archeology proper, the history of ancient literature, philosophy, politics, religion, and social life. The four great works of B. which have opened new paths in the study of antiquity are, 1st, his edition of Pindar (2 vols., Leip. 1811-22), in which the metre and rhythm of the poet, as well as his artistic skill, are investigated and discussed with profound knowledge of the subject. 2d, *The Political Economy of Athens* (2 vols., Berlin, 1817), a work which remains unsurpassed for subtle research, surprising results, and clear exposition. It treats of the prices of goods, rate of workmen's wages, rent of houses and land, and other points of commercial economy, as well as of the larger questions of the state income and expenditure. It has been translated into English by Sir George Cornewall Lewis, under the title of *The Public Economy of Athens* (Lond. 2d ed. revised, 1842). 3d, *Investigations concerning the Weights, Coins, and Measures of Antiquity* (Berl. 1838). 4th, *Records of the Maritime Affairs of Attica* (Berl. 1840). The most important of his lesser works are the *Development of the Doctrines of Philolaus, the Pythagorean*, his edition of the *Antigone* of Sophocles, and a *Dissertation on the Silver Mines of Laurion in Attica*. B. has also the honor of having commenced, 1824, the great work entitled *Corpus Inscriptionum Græcarum*, published at the expense of the Royal Acad. of Berlin, afterward continued first by Franz, and then by Kirchhoff. In 1852, appeared his *Researches on the Cosmical System of Plato*; in 1855, *The Lunar Cycles of the Greeks*; and, in 1858-74, his collected minor works (7 vols.).

BOCKING, n. *bōk'ing* [from *Bocking*, near Braintree, in Essex, where it was originally made]: a coarse woolen fabric.

BOCK'LAND, or **BOCLAND**, or **BOOKLAND**: one of the original modes of tenure of manor-land, also called charter-land or deed-land, which was held by a short and simple deed under certain rents and free services. It was land that had been severed by an act of government from the *Foleland* (q.v.), and converted into an estate of perpetual inheritance. It might belong to the church, to the king, or to a subject; it might be alienable and divisible at the will of the proprietor; it might be limited in its descent, without any power of alienation in the possessor. It was granted often for a single life or for more lives than one, with remainder in perpetuity to the church. It was forfeited for various delinquencies to the state.

The estate of the higher nobility consisted chiefly of B.

BODE—BODE'S LAW.

Bishops and abbots might have B. of their own in addition to what they held in right of the church. The Anglo-Saxon kings had private estates of B., and these estates did not merge in the crown, but were devisable by will, gift, or sale, and transmissible by inheritance, in the same manner as B. by a subject. (Kerr's *Blackstone*, vol. ii., p. 88; *An Inquiry into the Rise and Growth of the Royal Prerogative in England*, by John Allen, pp. 143–151; Wharton's *Law Dictionary*, 2d ed., under *Beckland*.)

BODE, v. *bōd* [AS. *bedian*, to deliver a message with a warning or command; *bod*, a message connected with AS. *beddan*, to command: Icel. *boda*, to announce]: to portend good or bad; to foretell; to foreshadow; to be ominous. BO'DING, imp. BODED, pp. BO'DING or BODEMENT, n. an omen; a portent; a foreshadowing. BODEFUL, a. ominous.

BODE, v. *bōd* [AS. *beddan*, to offer (see BID)]: in *Scot.*, and *OE.*, to offer with importunity: N. an offer made at a sale of goods, or in making a bargain. BO'DING, imp. BODED, pp. *bō'dēd*.

BODE, *bō'de*, JOHANN ELERT: 1747, Jan. 19—1826, Nov. 23; b. Hamburg, where his father kept a commercial academy: German astronomer. During boyhood, from the garret of his father's house, he observed the heavens with a telescope made by himself; at the age of 18 was patronized by Prof. Büsch; calculated the solar eclipse of 1766, Aug. 5, and in 1766 pub. an account of it beforehand; pub. 1768 an elementary treatise on astronomy; in 1772, was made astronomer to the Acad. of Sciences at Berlin. In 1774, he commenced a periodical, the *Astronomical Year-Book*, still continued. His most famous work is *Uranographia*, an atlas of the heavens (1801), containing observations on 17,240 stars, or 12,000 more than previous charts. See BODE'S LAW.

BO'DEN-SEE: see CONSTANCE, LAKE OF.

BODE'S LAW: an arithmetical relation traceable between the distances of the planets from the sun. It may be thus stated: Write, in the first instance, a row of fours, and under these place a geometrical series beginning with 3, and increasing by the ratio 2, putting the 3 under the second 4; and by addition we have the series 4, 7, 10, etc., which gives nearly the relative distances of the planets from the sun.

4	4	4	4	4	4	4	4	4
	3	6	12	24	48	96	192	384
4	7	10	16	28	52	100	196	388

Thus, if 10 be taken as the distance of the earth from the sun, 4 will give that of Mercury, 7 that of Venus, and so forth. The actual relative distances are as follows, making 10 the distance of the earth:

Mercury.	Venus.	Earth.	Mars.	Asteroids.	Jupiter.	Saturn.	Uranus.	Neptune.
3.9	7.2	10	15.2	27.4	52.9	95.4	192	300

No physical reason has been given to account for the cor

respondence so far as it is traceable between the law and the actual distances. B. L., therefore, in the present state of science, is termed empirical. Kepler was the first to perceive the law; he was followed by Titius, of Wittenberg; and Bode argued from it that a planet might be found between Mars and Jupiter, to fill up the gap that existed at the time in the series. The discovery of the Planetoids (q.v.) proves the correctness of this prediction. The greatest deviation from the law is seen in the case of Neptune; but if we were acquainted with the principles from which the law proceeds, we might also be able to account for the discrepancy. Similar relations, though expressed in different numbers, are found in the distances of the satellites of Jupiter and Saturn from their primaries.

BODGE, v. *bōj* [Ger. *patsche*, a puddle, mud]: in *OE.*, to make bad work; to fail; to stop: see **BOTCH**.

BODICE, n. *bōd'is* [formerly *bodies*—from fitting closely to the body]: a quilted waistcoat worn by females; stays.

BODKIN, n. *bōd'kīn*. [Gael. *biodachan*, a shoemaker's awl: Bohem. *bod*, a prick or stitch; *boduk*, a prickle or point]: a small spear-like instrument for fastening up the hair behind, much used by the women of antiquity; a sharp pointed instrument for piercing holes in cloth; anciently a common name for a dagger; a large blunt needle for drawing thread or tape through hemmed spaces.

BODLE, n. *bōd'l*: an old Scotch coin, value about the third part of a halfpenny. According to Jamieson, it was said to have been named from a mint-master whose name was *Bothwell*.

BODLEIAN or **BODLEYAN LIBRARY**, *bōd'lě-ăn*: the public library of Oxford Univ., restored by Sir Thomas Bodley (q.v.) 1598, his first act being the presentation of a large collection of valuable books, purchased on the continent at an expense of £10,000. Through his influence and noble example, the library was speedily enriched by numerous other important contributions. Among the earliest subsequent benefactors of the B. L., which was opened 1603, with a well-assorted collection of about 3,000 vols., were the Earl of Pembroke, who presented it with 250 vols. of valuable Greek MSS.; Sir Thomas Roe; Sir Kenelm Digby; and Abp. Laud, who made it a magnificent donation of 1,300 MSS. in more than 20 different languages. Upward of 8,000 vols. of the library of the famous John Selden (q.v.) went to the Bodleian Library. General Fairfax presented the library with many MSS., among which was Roger Dodsworth's collection of 160 vols. on English history. During the present century, the most important bequests have been the collections of Richard Gough, on British Topography and Saxon and Northern Literature; of Edmund Malone, the editor of Shakespeare; and of Francis Douce; also a sum of £40,000, by the Rev. Robert Mason, the interest to be expended on books. By purchase, the library acquired some magnificent collections of Oriental, Greek, Latin, and Hebrew

BODLEY—BODMANN.

books and MSS. The B. L. is particularly rich in biblical codices, rabbinical literature, and materials for British history. By the copyright act, it is entitled to a copy of every book printed in the United Kingdom. The number of volumes is estimated at about 400,000, in addition to 20,000 to 30,000 in manuscript. The first catalogue of the printed books was published by the first librarian, Dr. James, 1605; the last, nearly two centuries and a half later (1843), in 3 vols., by Dr. Bandinel, the eleventh who held the office since the institution of the library. In the interval, several catalogues of various departments of the library were published; and a supplemental volume was added by Dr. Bandinel, 1851. By statutes drawn up for the government of the library by Sir Thomas Bodley, it was decreed that the vice-chancellor, the proctors, and the regius professors of divinity, law, medicine, Hebrew, and Greek, should be visitors and curators; a statute passed 1856 added 'five more residents to be elected by congregation for ten years, if continuing to reside, and to be re-eligible.' Members of the univ. who have taken a degree are admitted to the use of the library—a small addition on the matriculation fees, and an annual payment, being charged for the privilege. Literary men, properly recommended, are allowed to make extracts from the works in the library, which is open between Lady-day and Michaelmas from 9 A.M. till 4 P.M., and during the other half of the year from 10 to 3. It is shut during certain holidays, and for visitation purposes, in the aggregate, about 34 days in the year, besides Sundays. Since 1861 the domed Radcliffe Library (now *Camera Bodleiana*) has served as a reading-room, open all the year from 10 A.M. to 10 P.M.

BODLEY, SIR THOMAS: 1545, March 2—1613, Jan. 28; b. Exeter, Eng: restorer of the library originally established at Oxford by Humphrey, Duke of Gloucester. His family being forced to flee from England during the persecutions of Mary, settled at Geneva, where B. studied languages and divinity under the most distinguished professors of that city. On the accession of Elizabeth, he returned to England, and completed his studies at Oxford, where he took the degree of M.A., and was afterward elected a proctor. After travelling some time abroad, he was employed by the queen in diplomatic missions to Denmark, France, and Holland, and returned to his favorite city, Oxford, 1597, where he applied himself to literature, especially to the extension of the univ. library, now called the *BODLEIAN* (q.v.), in B.'s honor. In collecting rare and valuable books from many parts of Europe, B. expended a very large sum, and also left an estate for salaries to officers, repair of the library, and purchase of books. He was knighted by King James, and died at Oxford. B.'s autobiography, extending to 1609, with a collection of his letters, has been published under the title *Reliquiæ Bodleianæ* (Lond. 1703).

BODMANN, *bod'mân* (ancient *Bodami Castrum*): village of Baden, at the mouth of the Stockach, on Lake Con

stance, with ruins of a castle, formerly the residence of the lieutenants (*Botemann* or *Bodmanno*, messenger or *legatus*) of the Carolingian kings; hence the German name of the lake, Bodman-n-see, or Boden-see. Pop. 900.

BODMER, JOHANN JAKOB: 1698, July 19—1783, Jan. 2; b. Greifensee, near Zurich. The study of the Greek and Latin writers, with the English, French, and Italian masters, having convinced him of the poverty and tastelessness of existing German literature, he resolved to attempt a reformation. Accordingly, in 1721, with a few other young scholars, he commenced a critical periodical, entitled *Diskurse der Muler*, in which the living poets were sharply handled. After 1740, when B. published a treatise on *The Wonderful in Poetry*, a literary war broke out between him and Gottsched, long waged with great bitterness; yet it partly prepared the way for the Augustan epoch of German literature. B. died at Zurich, in the univ. of which he had held the chair of history for 50 years. As an author, he was marked by inexhaustible activity, but his poems, dramas, and translations have no vigor or originality. His best known production is the *Noachide* (Zurich, 1752). He did greater service to literature by republishing the old German poets, the Minnesingers, and a part of the *Nibelungen*, as also by his numerous critical writings.

BODMIN: county town of Cornwall, Eng., in the middle of the county, 26 m. n.n.w. of Plymouth. It is partly in a valley and partly on the side of a hill, and consists principally of one street a mile long. Its chief trade is in cattle and sheep. Among the more important recent buildings are a market house, the county jail, and the new Cornwall lunatic asylum. B. arose in a priory founded in the 10th c., and was long an important place, having, besides the priory, a cathedral and 13 churches. The priory was once the property of Thomas Sternhold, one of the translators of the Psalms of David into English metre. 1,500 persons in B. are said to have died of the pestilence in 1351. Pop. (1881) 5,061; (1891) 5,151.

BODONI, *bo-do'n*, GIAMBATTISTA: 1740–1813; b. Saluzzo, Sardinia: type cutter and printer. He went to Rome, 1753, where he secured an engagement as compositor in the printing-office of the Propaganda, and remained till the death of his patron, Abbate Ruggieri, 1762 or 1766. In 1768, he went to Parma, where he published several specimens of his workmanship; among others—on occasion of the marriage of the Prince of Piedmont with the Princess Clotilde of France—the *Epithalamia Exoticis Linguibus Reddita*, which exhibited the alphabets of 25 languages. In 1789 the Duke of Parma made him supt. of his private printing establishment, and from this press he sent forth his edition of the *Iliad* (3 vols. 1808), dedicated to Napoleon. It is a splendid specimen of typography; but the correctness of the text is not equal to the beauty of the printing. His editions of Virgil (2 vols. 1793) and several Greek, Latin, Italian, and French classics, as also his

BODY—BOECE.

Lord's Prayer in 155 languages, are admired for their elegance. He died at Parma.

BODY, n. *bōd'ī* [AS. *bodig*; Gael. *bodhag*, a humal body: W. *bod*, to exist: Sks *banha*, the body: Ger. *botlich*, a cask]: the frame of an animal; a mass of living or dead matter; the main part or bulk; an individual or single person, as *no body*; a substance, as opposed to spirit; a collection of individuals; strength or quality of a material; a system or collection, as body of laws: V. to produce in some form. **BODIED**, a. *-id*, containing a body; having a material form. **BODILY**, a. *-ī-ly*, denoting body as opposed to mind; corporeal; real: AD. corporeally; entirely. **BODILESS**, a. having no body. **BODY POLITIC**, a state in its national or political capacity. **BODY-GUARD**, a select body of troops who attend on a sovereign for his protection. **BODY-SNATCHER**, one who snatches or steals a body from a graveyard for the purpose of dissecting it or selling to those who will do so.

BODY, HUMAN: see the titles of the various organs and functions.

BODY COLOR: in oil-painting, the opaque coloring produced by certain modes of combining and mixing the pigments. When, in water-color painting, pigments are laid on thickly, and mixed with white, to render them opaque, instead of in tints and washes, the works are said to be executed in body color.

BODY OF A CHURCH: commonly called the *Nave* (q.v.), though this latter term is sometimes employed to include the Aisles (q.v.). It is sometimes familiarly though incorrectly applied to the main or middle aisle.

BODY'S ISLAND: a low sand strip in Dare co., N. C., about 2 m. long; separates Roanoke and Albemarle sounds from the Atlantic; its s. end is near Oregon inlet. On the n. end is a light 150 ft. high, in 35° 48' 47" n., 75° 33' 20" w.

BODY-SNATCHING: see ANATOMY, in Law.

BOECE, or, more properly, **BOYCE**, *boys*, **HECTOR**: abt. 1465–1536; b. Dundee, of an old family: distinguished Scottish historian. He completed his education at Montague College, in the Univ. of Paris, and, 1497, was appointed prof. of philosophy. Among other learned men whose friendship he here acquired was Erasmus. About the beginning of the 16th c., he was invited by Bp. Elphinstone to preside over the univ. newly founded by him at Aberdeen. B. accepted the office after some natural hesitation, the yearly salary being 40 merks, or about £2. 4s. 6d. sterling. The value of money, however, it has to be remembered, was immensely greater then than now, and the learned principal was at the same made a canon of the cathedral, and chaplain of St. Ninian. There is every reason to suppose that he discharged his duties with high success. In 1522, he published his lives, in Latin, of the Bishops of Mortlach and Aberdeen. This work, a great part of which is occupied with the life of his excellent patron, Bp. Elphinstone, was reprinted by the Bannatyne

BOEHM—BŒHMERIA.

Club, 1825. In 1527, B. published the Latin *History of Scotland*, on which his fame chiefly rests, a work which, though proved to contain a large amount of fiction, is worthy of the commendation it has received even on the score of style. The author was rewarded by the king with a pension of £50 Scots, until he should be promoted to a benefice of 100 merks, which appears to have occurred 1534. See BELLENDEN, JOHN.

BOEHM, böm, Sir JOSEPH EDGAR, Bart., R.A.: sculptor: 1834, July 6—1890, Dec. 12; b. Vienna, of Hungarian parents. He was educated at Vienna, and 1848–51 in England; he studied in Italy also, and for 3 yrs. in Paris. He made his home in England 1862, and resided there till his death. B. received the first imperial prize at Vienna 1856; was elected member of the Acad. of Florence 1875, associate of the London Royal Acad. 1878, royal academician 1882; created baronet 1883. Among his very numerous works are: a colossal statue in marble of Queen Victoria, 1869; colossal statue of John Bunyan, 1872; colossal equestrian statue of the Prince of Wales, 1877; statue of Thomas Carlyle; horse group in bronze for Eton; colossal equestrian statues of the great Duke of Wellington, of Lord Napier of Magdala, and of Lord Northbrook; statue of King Leopold I. of Belgium; recumbent statues of Gen. (Chinese) Gordon and of many church dignitaries. At the Royal Exhibition, 1889, B. exhibited *The British Guardsman of 1818* and *The Inniskillen Dragoon of 1815*. Notable among his works are a life-size bull, with his leader, in marble, and a large equestrian bronze group of *St. George and the Dragon*; several race-horses; a colossal lion and lioness; a sea-lion in black marble, etc. He executed busts of Gladstone, John Bright, John Ruskin, etc., and designed the effigy of Queen Victoria for the coinage commemorative of the 50th year of her reign.

BŒHMERIA: genus of plants of the nat. ord. *Urticæ*, included, until recently, in the genus *Urtica* or Nettle (q.v.). The fibres of a number of species are used for making ropes, twine, nets, sewing-thread, and cloth; and some of them appear likely to acquire much economical and commercial importance. *B. nivea* (formerly, *Urtica nivea*) has been recently ascertained to yield great part of the fibre employed in China in the manufacture of the beautiful fabric known as *China-grass* (q.v.) cloth. It is a perennial herbaceous plant, with broad ovate leaves, which are white and downy beneath, and is destitute of the stinging powers of the nettles. It is carefully cultivated by the Chinese, by whom it is called *Tchou Ma*. It grows naturally, and is also cultivated in Sumatra, Siam, Burmah, Assam, and other parts of the East. The fibre is called *Caloce* in Sumatra, *Ramie* by the Malays, and *Rheea* in Assam. Recently, this plant, under its Malay name *Ramie* (q.v.) has been introduced into cultivation in Cal. and some of the southern states, with moderately encouraging results as to production of fibre.—*B. candicans*

BŒOTIA.

and *B. utilis*, from which a fine silky fibre is obtained in Java, are either varieties of this or nearly allied species.—*B. frutescens* is another important species, common in Nepaul, Sikkin, and other parts of the Himalaya, to an elevation of 3,000 ft. above the sea. It is not cultivated, but often overruns abandoned fields. It grows to a height of 6 or 8 ft. and varies from the thickness of a quill to that of the thumb. The leaves are serrated, dark-green above, silvery-white below, not stinging. The plant is cut down for use when the seed is formed; the bark is then peeled off, dried in the sun for a few days, boiled with wool-ashes for four or five hours, and beaten with a mallet to separate the fibres, which are called *Pooah* or *Poe*, and also *Kienki* or *Yenki*. When properly prepared, the fibre is quite equal to the best European flax.—The fibres of a number of coarser species are employed in different parts of the East Indies for making ropes.

BŒOTIA, *be-ō'she-a*: one of the ancient political divisions of Greece; bounded on the n. and n.w. by Locris and Phocis, on the e. by the Eubœan Channel, on the s. by Attica and Megaris, and on the w. by the Corinthian Gulf. B. had a surface estimated at 1,120 sq. m. The plains enclosed on the s. by Mounts Cithæron and Parnes, on the w. by Mount Helicon, on the n. by the slopes of Mount Parnassus and the Opuntian Mountains, fall naturally into three divisions—the basin of the lake Copais, now called Topolias, that of the Asopus, and the coast-district on the Crissæan Sea. The principal stream was anciently called the Cephissus. It entered the country from Phocis at Chæronea; and in the spring, when it was swollen by innumerable torrents, almost converted the Copaic plain into a lake. There were several natural channels for the outlet of the waters that congregated in this plain, but they were not sufficient to carry off the surplus, and the surrounding country was in consequence frequently deluged. In order to guard against this inundation, two tunnels had been cut in the rock for the discharge of the water. One of these tunnels, which carried the water to Upper Larymna—where it emerged in a natural outlet after a subterraneous course of nearly 4 m., whence it flowed above ground a mile and a half to the sea—was no less than 4 m. in length, with about twenty vertical shafts let down into it, some of which were from 100 to 150 ft. deep. The other tunnel, which united the Copais Lake with that of Hylica, was much shorter, but still an extensive work. The date of these gigantic engineering undertakings is not precisely known, but they are generally attributed to the Minyæ or Orchomenus. B. was in ancient times very productive of marble, potter's earth, and iron, besides abounding in corn and fruits; and it was also particularly celebrated for flute-reeds. The earliest inhabitants belonged to different races, the two most powerful of which were the Minyæ and Cadmeans or Cadmeones; but were at an early date (about 60 years after the Trojan war, according to Thucydides) in part dislodged by the Bœotians, an Æolian people who were driven from Thessaly, and in part incorporated with them. The Bœotians excelled as cultivators of the soil, and

BŒOTIAN—BOER.

were gallant soldiers both on foot and horseback; but they were rude, unsociable, and took little part in the gradual refinement of manners and intellectual development of the rest of Greece, so that the name became proverbial for illiterate dulness. This was usually ascribed to their thick damp atmosphere. Yet there have not been wanting among them eminent generals, as Epaminondas; and poets and historians, as Hesiod, Pindar, Corinna, Plutarch, etc. The greater cities, of which the number was about 14, Thebes, Haliartus, Thespiæ, etc., with their territories, formed the Bœotian League. At the head of this was an archon, and next to him a council, composed of four persons, having its headquarters in Thebes. The executive authority was intrusted to Bœotarchs, elected in popular assemblies of the separate states, and holding office only one year. Of this league, a shadow remained down to the times of the empire; but after the battle of Chæronea, in which Philip established the Macedonian throne on the ruins of Grecian liberty, the political importance of the country declined so rapidly, that about B.C. 30, only two cities, Tanagra and Thespiæ, were of any consideration.—With Attica, B. now forms one of the ‘nomarchies’ of the kingdom of Greece.

BŒOTIAN, *a. be-ô'shan*: pertaining to Bœotia (q.v.); stupid; dull in intellect.

BOER, *n. bô'er* or *bôr* [Dut.]: a farmer, a Dutch colonist of the Cape of Good Hope, south Africa, engaged in agriculture and the care of cattle. The Boers, generally, according to Dr. Livingstone, ‘are a sober, industrious, and most hospitable body of peasantry.’ Very different, however, are certain of their numbers who have fled from English law, on various pretexts, and formed themselves into a republic in the Cashan Mountains. Coming, ‘with the prestige of white men and deliverers’ from the cruelty of Kafir chiefs, they were received by the Betjuans gladly, who, however, soon found out that their new friends were much less desirable as neighbors than their old enemies. These among the Boers force even those tribes of the Betjuans who are most friendly toward them to perform all kinds of field-labor for nothing; and not only this, but they also compel them to find their own implements of labor and their own food. They steal domestic servants from the more hostile tribes in the most cowardly and cold-blooded way imaginable. The plan of operation is thus described by Dr. Livingstone: ‘One or two friendly tribes are forced to accompany a party of mounted Boers, and these expeditions can be got up only in the winter, when horses may be used without danger of being lost by disease. When they reach the tribe to be attacked, the friendly natives are ranged in front to form, as they say, “a shield;” the Boers then coolly fire over their heads till the devoted people flee, and leave cattle, wives, and children to the captors. This was done in nine cases during my residence in the interior, and on no occasion was a drop of Boer’s blood shed.’ They have an immense contempt for the ignorance of the natives, and told Dr. Liv

ingstone that he might as well teach baboons as Africans. See ORANGE RIVER COLONY. The Boers of the Transvaal (q.v.) were hostile to the British annexation in 1877, and after a short campaign they secured in 1884 the restoration of independent government under certain conditions, British suzerainty being recognized.

BOERHAAVE, *bōr'hāv* or *bōr'hai-vēh*, HERMANN: 1668, Dec. 31—1738, Sep. 23; b. Voorhout, near Leyden: most celebrated physician of the 18th c. In 1682, he went to Leyden with the intention of becoming a clergyman, and there studied Greek, Latin, Hebrew, Chaldee, history, ecclesiastical and secular, and mathematics. In 1689, B. was made doctor of philosophy, and in 1690 began the study of medicine, reading carefully Hippocrates among the ancients, and Sydenham among the moderns. Though mainly self-educated in medicine—as in chemistry and botany—he gained his doctor's degree at Harderwyck, 1693, and returned to Leyden, where, in 1701, having abandoned theology, he was appointed lecturer on the theory of medicine, and in his inaugural lecture recommended to the students the ancient method of Hippocrates in medicine; but in 1703 his views had become greatly enlarged. He saw the necessity of *a priori* speculations, as well as of the Hippocratic method of simple observation, and elaborated various mechanical and chemical hypotheses to explain the diseases of the body, especially in the case of the fluids. In 1709, he was elected prof. of medicine and botany in the place of Hottot. About this time, he published the two works on which his great fame chiefly rests: *Institutiones Medicæ in Usus Annuæ Exercitationis Domesticos* (Leyd. 1708), and *Aphorismi de Cognoscendis et Curandis Morbis, in Usum Doctrinæ Medicinæ* (Leyd. 1709), both of which went through numerous editions, and were translated into various European languages, and into Arabic. In the first work—a model of comprehensive and methodical learning—he gives a complete outline of his system, including a history of the art of medicine, an account of the preliminary knowledge necessary to a physician, and a description of the parts and functions of the body, the signs of health and disease, etc.; in the second, he gives a classification of diseases, with their causes, modes of treatment, etc. B. also rendered important services to botany. One of his best lectures is that delivered on his resignation of the office of rector of the univ., *De Comparando Certo in Physicis*. To combine practice with theory, he caused a hospital to be opened, where he gave clinical instructions to his pupils. Though so industrious in his own profession, he undertook, 1718, after Lemort's death, the professorship of chemistry, and published, 1724, his *Elementa Chimiæ*, a work which did much to render this science clear and intelligible, though now superseded by modern researches. His fame had meanwhile rapidly increased. Patients from all parts of Europe came to consult him. Peter the Great of Russia visited him; and it is even said that a Chinese mandarin sent him a letter, addressed 'HERR BOERHAAVE, celebrated physician Europe.'

BOERHAAVIA—BOËTHIUS.

He was a member of most of the learned academies of the day. He realized from his profession a fortune of two millions of florins.—Burton, *Account of the Life and Writings of B.* (2 vols. Lond. 1743); Johnson, *Life of B.* (Lond. 1834).

BOERHAAV'IA; see NYCTAGINACEÆ.

BOERIO, *bo-ā're-o*, JOSEPH: 1754–1832; b. Lendinara, Italy: Italian jurist and legal writer. His father was a distinguished magistrate, who received him as coadjutor, when but 20 years of age. B. was successively appointed judge of various courts. He published in Italian excellent works, the principal of which are entitled: *Raccolta delle leggi venete* (1793, 2 vols.); the *Pratica del processo criminale* (1815); *Repertorio del codice criminale austriaco* (1815); *Dizionario del dialetto Veneziano* (1827), etc.

BOERNE, or BÖRNE, *bŭr-nĕh*, LUDWIG: 1786–1837; b. Frankfort-on-the-Main, of Jewish extraction: celebrated German journalist and critic. He studied at Heidelberg and Giessen, and afterward became editor of the *Staats-Ristretto*, a democratic journal that was soon suppressed. Having abjured Mosaism for Protestantism, he became editor (1818) of the *Wage*, a periodical of literature, science, and art. In 1819, and again in 1822, he felt constrained to flee to France for a refuge against persecutions. During his last sojourn he published in the journals *Pictures of Paris*, charming articles, which have entitled him to a place among the best humorists. After the revolution of 1830 appeared his *Letters on Paris*, which had a great success with the revolutionary party in France, and were instrumental in agitating Germany. He published a translation of Lamennais's *Words of a Believer* (1834). In 1835, he wrote articles for the *Reformer*, a republican journal. His political friends raised a monument in his honor, executed by David (Pierre Jean) of Angers. Beside the works already cited, he wrote a curious history of the censorship of Frankfort, and *Menzel der Franzosen-fresser*, considered his best work.

BOËTHIUS, *bō-ē'thŭ-us*, ANICIUS MANLIUS SEVERINUS (to which a few MSS. add *Torquatus*): b. between 470 and 475; d. 524 or 526: Roman statesman and philosopher. The family to which he belonged had been distinguished both for its wealth and dignity for two centuries. His own father held the office of consul, but dying while B. was still a boy, the latter was brought up under the care of Festus, Symmachus, and other honorable Romans. He studied with enthusiasm philosophy, mathematics, and poetry, translated and elucidated with laborious care the writings of Aristotle, and of the old mathematicians Euclid, Archimedes, Ptolemæus, and others; but the story of his 18 years' stay at Athens is entirely unhistorical. B. soon attracted notice; he became a patrician before the usual age, a consul in 510, and also *princeps senatus*. Having, moreover, gained the esteem and confidence of Theod-

oric, King of the Goths, who had fixed the seat of his government at Rome in the year 500, he was appointed by that monarch *magister officiorum* in his court. His influence was invariably for the good of Italy, and his countrymen owed it to him that the Gothic rule was so little oppressive. His good-fortune culminated in the prosperity of his two sons, who were made consuls 522. But his bold uprightness of conduct, springing from strong faith in his philosophic ethics, and courage to regulate his official conduct by them—at last brought upon him the unscrupulous vengeance of those whom he had checked in their oppressions, and provoked by his virtues. He was accused of treasonable designs against Theodoric; and the king, despondent and mistrustful in his old age, was induced to listen to the charges. B. was stripped of his dignities, his property was confiscated, and he himself, after having been imprisoned for some time at Pavia, was put to death; according to one account, with circumstances of horrible cruelty. During his imprisonment, B. wrote his famous *De Consolatione Philosophiæ*, divided into five books, and composed in the form of dialogue, in which B. himself holds a conversation with Philosophy, who shows him the mutability of all earthly fortune, and the insecurity of everything save virtue. The work is composed in a style which happily imitates the best models of the Augustan age, and the frequent fragments of poetry interspersed show truthfulness of feeling and metrical accuracy. The *Consolatio* is piously *theistic* in its language, but affords no indication that B. was a Christian; and if the doctrinal treatises ascribed to him are, as the acutest criticism maintains, not genuine, we must class him in religion rather with Marcus Aurelius than with his alleged friend, St. Benedict. He was the last Roman writer of any mark who understood the Greek language and literature. During the middle ages, he was regarded with profound reverence, as the *Augustine* of philosophy, but on the introduction of the Aristotelian metaphysics in the 13th c., his reputation gradually sank. The first edition of B.'s entire works appeared at Venice, 1491–2; a more correct one at Basel, 1570. The oldest edition of the *Consolatio* is that published at Nürnberg, 1473, but many manuscript translations into various languages had appeared long before the invention of printing—among them that by King Alfred into Anglo-Saxon.

BOG.

BOG, n. *bög* [Ir. *bogach*, a bog or marsh: Gael. *bog*, soft; *bogan*, a quagmire]: a deep soft marsh; a tract of land, consisting of decayed vegetable matter, rendered soft by water. **BOG-BERRY**, a name for the Cranberry, *Vaccinium oxycoccus*. **BOG EARTH**, a soil consisting mainly of decomposed vegetable matter. **BOG-BUTTER**, a name given to fatty masses occasionally found in peat-mosses. **BOG IRON ORE**, a stratum or deposit of oxide of iron found in the bottoms of many bogs and peat-mosses. **BOG-WOOD**, the trunks and larger branches of trees dug up from peat-bogs. **BOGTROTTER**, one who lives among bogs—formerly applied to the Scotch Border troopers or robbers, and to a similar class among the Irish, from the ability acquired by many of them of traversing the extensive bogs of their native country, passing from tussock to tussock, where a stranger would find no secure footing, and in the frequent use which they made of this ability to escape from soldiers, officers of police, or other pursuers; now sometimes applied in disparagement to a certain class of Irishmen. **BOG RUSH**, a bird the size of a wren, inhabiting the bogs of Sweden. **BOG-SPAVIN**, a tumor in the inside of the hough of a horse. **BOGGY**, a. *bög'gĩ*, full of bogs. **BOG-BEAN** or **BUCK BEAN**, one of the gentians, a plant possessing bitter tonic properties; the *Měnyān'thes trifoliātā*, ord. *Gentiānācēæ*. **BOG-MYRTLE**, or **DUTCH MYRTLE**, a well-known strong-scented shrub, growing in moist boggy places; the *Myricā gālē*, ord. *Myricācēæ*. **BOG-OAK**, the trunks and larger branches of oak and other trees dug from peat-bogs, having an ebony color, arising from an impregnation of iron.

BOG: a deep soft marsh; specially, a **PEAT-BOG** as distinguished from every other kind of swamp or morass. The spongy texture of the peat covering retains water, and converts the land into a kind of quagmire. The term **PEAT-MOSS** is sometimes employed, particularly in Scotland, and even simply **Moss**. The word **Bog** is of Irish origin, being from a Gael. root, signifying a bobbing, quaking motion.

Bogs of great extent exist in some of the northern parts of the world. A very considerable part of the surface of Ireland is occupied with them. The Bog of Allen (see **ALLEN**, **BOG OF**) is the most extensive in the British Islands, although its continuity is not altogether unbroken, strips of arable land intersecting it here and there. The Solway Moss (q.v.), on the w. borders of England and Scotland, is about seven m. in circumference. Chatmoss (q.v.), in Lancashire, famous for the engineering difficulties which it presented to the formation of the first great English railway, is 12 sq. miles in extent. The swamps of the e. of England are in general not peat-bogs, but consist chiefly of soft mud or silt.

The general surface of a bog is always nearly level, but usually varied with rushy tussocks rising above the rest, and having a rather firmer soil. By the continued growth of peat, the surface of a bog is gradually elevated; that of Chatmoss, for example, rises above the level of the surrounding country, having a gradual slope of 30 or 40 ft.

from the centre to the solid land on all sides. In rainy weather, it sensibly swells, the spongy mass imbibing water, while the mosses and other growing plants on the surface prevent evaporation. Occasionally, the quantity of water becoming excessive, a bog *bursts*, and pours a terrible deluge down the course of a stream, causing great devastation, not only by the force of its torrent, but by the enormous quantities of peat which it deposits upon meadows and cultivated fields, as has recently happened in some memorable instances in Ireland. The depth of a bog is sometimes more than 40 ft. The spongy mass of which it is formed shakes on the least pressure. Sometimes it is impossible to traverse it; in other cases, it is possible only for those who are well accustomed to it, a false step being a plunge into a quagmire, in which a man sinks as in a quicksand. Safety is sometimes insured by 'pattens'—boards fastened upon the soles of the feet—a method which Mr. Roscoe of Liverpool, in his extensive operations for reclaiming land from Chatmoss, employed also to enable horses to work upon its surface. It was not the least remarkable triumph of the genius of Stephenson, to extend the same principle to the support of the railway. Tradition reports that at the battle of Solway, 1542, a fugitive troop of horse plunged into the moss, which instantly closed upon them; and in the end of the 18th c., this tradition was confirmed by the discovery, made in peat-digging, of a man and horse in complete armor.

One of the remarkable phenomena of peat-bogs is the frequent presence of roots and fallen trunks of trees, in a good state of preservation, many feet below the surface. From the black bog-oak of Ireland, various small fancy articles are manufactured. The fact that trees are found imbedded in bogs leads to the inference that in many instances these morasses originated in the decay or partial destruction of ancient forests: see PEAT. There is a popular division of bogs into two classes—*Red Bogs* and *Black Bogs*; the decomposition of the vegetable matter in the former being less perfect, and the substance, consequently, more fibrous and light than in the latter. There is indeed no precise line of distinction, and all intermediate conditions occur. The most extensive bogs are red bogs, and they are said to cover 1,500,000 acres in Ireland. Black bogs, although comparatively of small extent, are more numerous, particularly in elevated districts, for which reason they are sometimes called *mountain bogs*. The depth of red bogs is usually much greater than that of black bogs.

The conversion of bogs into good pasture or arable land is a subject of national importance. There can be no doubt that much of the land now occupied by bog is capable of being rendered very productive, while the effects of extensive bogs upon the climate are always injurious. The reclaiming of shallow mountain bogs is comparatively easy, and in some cases it is effected by a very simple and inexpensive drainage, and by throwing them at once under cultivation in a manner analogous to that known in Ireland as the *larry*.

bed method of planting potatoes—the soil upon which the bog rests being partially dugged up and thrown over its surface. Great difficulties, however, attend the reclaiming of red bogs. It has unfortunately happened, particularly in Ireland, that the tenures of land and the want of capital on the part of the owners of estates have formed the most insuperable of all obstacles to improvements of this kind, which, however, have been carried on to considerable extent since the middle of the 18th c., and have in general proved highly remunerative. A chief difficulty, in some cases, is caused by the low situation of the bog, and the want of *fall* for drainage. Another great difficulty is presented by the spongy substance of red bogs being extremely retentive of water, so that a deep ditch drains only a very narrow strip on each side of it. A difficulty has been also found in disposing of the peat, where, a good soil being known to exist below, it has been attempted to reclaim land by removing the peat instead of draining it and converting its own surface into soil. To some extent, in such cases, the peat is advantageously disposed of for fuel, or to be used as a species of manure for other soils; but the demand for these purposes is often insufficient for any other than a very slow process of improvement in an extensive bog. The peat is therefore, sometimes, by various means, floated off, as in the long-continued operations at Blair-Drummond, on the banks of the Forth, the results of which have for many years formed a peculiar feature on the shores and in the bays of the upper part of the Firth of Forth. But when a similar method was more recently introduced in an extensive moss in the low lands of Renfrewshire, the Clyde trustees interposed to prevent it, in the interests of the navigation of the river. A portion of the peat, taken from the upper surface, is not unfrequently burned in heaps upon the spot, the ashes becoming a manure, and assisting in the formation of a soil.

Of course, the first essential in the reclaiming of bogs is drainage. The method of effecting this must be varied according to circumstances; but very frequently, after a general outlet with sufficient fall has been secured, wide open drains are cut, by which the bog is divided into strips, which again are traversed and subdivided by smaller drains. When these drains begin to serve their purpose, the surface of the bog sinks, and their depth is reduced; they are then often deepened, and at last a permanent system of covered drains emptying themselves into open ditches is thus formed, and fits the land for all the purposes of agriculture. It is, however, often plowed before this state of things is attained, the plow-horses being shod with the *pattens* already mentioned, and socks and coulter of unusual sharpness being employed for the cutting of the bog. Various implements have also been devised for cutting the moss, to facilitate cultivation. Lime, calcareous sand, clay, and other manures are applied, according to circumstances, to promote the conversion of the peat into useful soil. Sometimes the first crop taken from the plowed bog is a crop of oats; sometimes it is

BOGAN RIVER—BOGEN.

found preferable to begin with rape, turnip, or the like. In some places in the North of Ireland, floria grass (see BENT GRASS) has been sown on bogs in process of being reclaimed, and enormous crops have obtained. See WASTE LANDS.

BO'GAN, or NEW-YEAR, RIVER, the *Allan Water* of Oxley: an interior stream of e. Australia, joins the Darling, after a generally n.w. course of more than 300 m., about lat. 30° s., and long. 146° e. Its source is in the Harvey Range; about lat. 33° s., and long. $148^{\circ} 30'$ e.

BOGAR'DUS, EVERARDUS: d. 1647: first minister of the Ref. Dutch Ch. in New Amsterdam, now New York; came to America about 1633. In 1638, he married a widow, Anneke Jans, owner of a 60-acre farm in a now important business part of New York. Sailing for Holland to answer certain ecclesiastical charges, he perished by shipwreck in the Bristol channel.—The heirs of B. have brought many suits for recovery of the above-named tract, which fell into possession of Trinity Church, but in vain, the title being secure.

BOG BUTTER, or BUTYRELLITE: substance found in some of the bogs of Ireland, and until quite recently supposed to be a mineral of vegetable origin, and classed among acid oxygenated hydrocarbons in mineralogy. But Macadam has proved it to be simply butter, by chemical examination corroborated by finding cow-hair in many samples! In one of the bogs there were skulls of oxen. According to old analyses, it contains about 74 per cent of carbon; its remaining constituents being oxygen and hydrogen in nearly equal proportions. In color and consistency it much resembles butter, and at 124° F. it becomes liquid. It is not soluble in water, but is readily dissolved by alcohol.

BOGDANOVITCH, *bog-dâ-no'vitch*, HIPPOLYTUS THEODOROVITCH: 1743, Dec.—1803, Jan.; b. Perevolotchna, Little Russia. His fame rests entirely upon his poem *Dushenka*, published 1775. The story of Psyche forms the groundwork of the poem, which is characterized by a refined and graceful style, and vivacious playfulness of language. Its publication made him at once famous, as well as obtained for him the high favor of the court; but there can be no doubt that the popularity of the work was as much owing to the adventitious circumstances in which it was produced—nothing of the kind having been previously attempted in Russia—as to its intrinsic merits. B., though he wrote much afterward, never equalled his first performance.

BOGEN, *bo'ghên*: town of Bavaria, in the circle of Lower Bavaria, on the left bank of the Danube, about 6 m. e. of Straubing. It has extensive breweries, but is celebrated chiefly for its chapel, still a place of pilgrimage, built on a neighboring height. Here, according to tradition, a hollow stone image of the Virgin, floated up by the river, remained stationary; and its miraculous arrival had the effect of converting a notorious robber-chief, the ruins

of whose castle now inclose the church. Innumerable pilgrims flocked to the image, including at various times three German emperors, and the monks grew very wealthy on their offerings. Pop. 1,400.

BOGENHAUSEN, *bô'ghen-how'zen*: village in Bavaria, lat. 48° 8' n., lon. 11° 36' e.; abt. 2 m. n e. of Munich. It is the seat of the royal observatory of Munich, one of the best equipped in the world.

BOGERMANN, *bô'gër-mán*, JOHANN: 1576-1633; b. at the village of Opelwert, in Friesland: pres. of the Synod of Dort. He took a violent part in the religious controversies which inflamed, with unwonted fire, the Dutch mind at the beginning of the 17th c. His hatred of Arminianism extended itself to the persons who upheld it, and his zeal was on various occasions gratified by securing the punishment of those who had the misfortune to differ in opinion from him. He translated and recommended Beza's book on the *Capital Punishment of Heretics*; and about 1614, ventured to assail the great Grotius in a polemical treatise, which, with most of the angry literature of the period, has properly perished. In 1618, B. was elected pres. of the synod of Dort; but his conduct there does not seem to have given satisfaction to the Frieslanders who had delegated him, for he was accused on his return of having exceeded his instructions. For one thing, however, B. deserves great credit, his translation of the Bible into the vernacular. Four other persons were associated with him in the task, but the translation of the Old Testament is chiefly B.'s work, and is characterized by taste, fidelity, and purity of language. It is still used in the Dutch churches. B. died at Franeker, in the univ. of which he was primarius prof. of divinity.

BOGEY, n. *bô'gĭ* [W. *bwg*, something to frighten: Slav. *bog*, a god]: a nursery name for an evil spirit; some goblin in particular. BUG applies to goblins in general.

BOGEY, or BOGIE, n. *bô'gĭ*: on *railways*, a small flat wagon used by surfacemen for conveying small quantities of material from point to point, and which may be easily lifted off and put on the rails; may have been so termed from the light low wagons employed in filling up the track for the Manchester and Liverpool railway over the Chat Moss or *bog*. BOGEY-ENGINE, an engine which, instead of resting on two wheels in front, rests and swivels on a *bogey* having four wheels, so as to take curves better.

BOGGLE, v. *bôg'gl* [imitative of a stammer or stutter, and represented by the syllables *gag* or *gog*, *bag* or *bog*: Bret. *gagoula*; Port. *gaguejar*, to stutter: F. *bagouler*, to gabble]: to start aside through fear; to doubt; to hesitate; to waver; to make difficulties over a matter. BOG'GLING, imp. BOGGLED, pp. *bôg'gld*. BOG'GLER, n. *-glër*, one who. BOG'GLISH, a. doubtful.

BOGGS, *bôgz*, CHARLES STUART: naval officer: 1811, Jan. 28—1888, Apr. 22; b. New Brunswick, N. J. He was appointed midshipman 1826, Mar. 1, and promoted lieut. 1837, Sep. 6. During the Mexican war he was attached to the

Princeton. He was promoted commander 1855, Sep. 15. He was with Farragut in the attack on the forts at the mouth of the Mississippi 1862, when he destroyed two rams which sank his ship. He was promoted capt. 1862, July 16; commodore 1866, July 25; rear-admiral 1870, July 1; and retired 1873.

BOG IRON ORE: mineral of very variable composition, but regarded as consisting essentially of peroxide of iron and water; the peroxide of iron often amounts to about 60 per cent. the water to about 20. Phosphoric acid is usually present in quantities varying from 2 to 11 per cent. Silicic acid, alumina, oxide of manganese, and other substances, which seem accidentally present, make up the rest. B. I. O. occurs chiefly in alluvial soils, in bogs, meadows, lakes, etc. It is of a brown, yellowish-brown, or blackish-brown color. Some of its varieties are earthy and friable, formed of dull dusty particles; some are in masses of an earthy fracture, often vesicular; and some more compact, with conchoidal fracture. It is abundant in some of the n. and w. islands of Scotland, and in the n. countries of Europe generally; also in N. America. When smelted, it yields good iron. See IRON, ORES OF. In respect to the source of B. I. O., the iron everywhere present in soils as yellow, brown, or red coloring, and often as a peroxide constituent of minerals in rocks, is reduced to protoxide by organic matter in solution (this matter taking 3 of the 5 atoms to oxidize itself); the protoxide unites with carbonic acid, forming iron carbonate, which is soluble in excess of the acid. Thus the iron is leached out, and, when again peroxidized by air, deposited in the basins that become bogs, where the iron is usually the hydrated peroxide, yellow in powder. Upturned beds, metamorphosed into magnetic iron ore, had the same origin.

BOGLE, or BOGGLE, n. *bō'gl* [from *bo* or *boo*, the cry made by a person with his face covered by his hands to frighten children: W. *bo*; It. *bau*]: a bugbear; something that terrifies.

BOG MOSS: see SPHAGNUM.

BOG'NOR BEDS: see LONDON CLAY.

BOGODOUKHOV, *bo-go-dō-kov'*, or **BOHODUKHOV'**: fortified town of Russia, in the gov't. of Kharkov, on the Merle, 29 m. n.w. of the city of Kharkov. The chief industry is leather-dressing and boot-making. B. has considerable trade in cattle and hides. Pop. about 12,000.

BOGOMILI, *bō-go-mī'li*: religious sect which came into notice in the 12th c., whose chief seat was in Thrace. They resembled the Paulicians and Cathari. Their name, derived from the Bulgarian *Bog*, 'Lord,' and *milui*, 'have mercy,' refers to the frequency of their prayers. The basis of their creed was as follows: Out of the eternal Divine Essence or Being sprang two principles—Satanael and Logos; the former, at first good, afterward rebelled, and created in opposition to the original spiritual universe a world of matter and human beings. These human beings, however, received from the Supreme Father a life-spirit; but **this**

BOGOTÁ.

was kept in slavery by Satanael until the Logos or Christ came down from heaven, and assuming a phantom body, broke the power of the evil spirit, who was henceforth called only Satan. The B., like all similar sects, practiced a severe asceticism, despised images, and rejected Baptism and the Lord's Supper. Instead of Baptism they placed their hands and an apocryphal gospel of St. John on the head of the neophyte, singing at the same time the Lord's Prayer, which they repeated seven times during the day, and five times during the night. They accepted the whole of the New Testament, but of the Old Testament only the Psalms and Prophets, which they interpreted allegorically. In 1118, that vehement hater of heretics, Alexius Comnenus, burned their leader Basilius. Persecution, however, did not put an end to the B., and at the time of the Mohammedan conquest of Bosnia (16th c.), we find that the greatest number of the renegade Christians who embraced the religion of the conquerors belonged to this sect. There are some B. even at the present day.

BOGOTÁ, *bo-go-tá'*, more fully SANTA FÉ DE BOGOTÁ: federal capital of the united states of Colombia, formerly New Granada, S. America. It is within the limits of Cundinamarca; lat. $4^{\circ} 6'$ n., and long. $78^{\circ} 30'$ w., on a table-land, which, at an elevation of 8,694 ft. above the sea, separates the basin of the Magdalena from that of the Orinoco. Independently of its political importance, B. occupies a commanding position in relation to commerce. It lies on the most convenient route between Quito and the Caribbean Sea; while by navigable affluents of the Orinoco and the Magdalena, distant respectively 37 and 55 m., it has a two-fold access to tide-water. Its immediate vicinity, too, is favorable to the growth of a great city and the maintenance of a large population. The table-land measures about 60 m. from n. to s., and about 30 from e. to w., being bounded on all sides by mountains which, though lofty enough to give shelter, are yet below the line of perpetual snow. This extensive plain—a temperate zone on the verge of the equator, with a singularly genial and salubrious climate—is exceedingly fertile, yielding abundant crops of wheat and barley, as also generally of the leguminous plants cultivated in Europe; while, favored as it is with two rainy seasons in a year, it is as rich in pasture as in grain, affording ample sustenance to numerous flocks of sheep and herds of cattle. B. was founded 1538, consisting then of 12 houses in honor of the 12 apostles. Prospectively, also, the surrounding mountains promise, one day, to give to industry many valuable minerals, such as iron, coal, and salt. The last two, in fact, have already been obtained to some extent. Mines of emeralds, gold, silver, and copper also are said to be within the same district. B. is regularly and handsomely built. It has four public squares and five elegant bridges over two small rivulets—the San Francisco and the San Augustin. Like every place in Spanish America, it teems with churches and convents—two of the latter overhanging the city on twin hill-tops at a height of 2,500 ft. above the general level. B.

BOGOUSLAV—BOG SPAVIN.

likewise possesses, in addition to official buildings, a mint, a theatre, a university, and spacious barracks. A short way from the city, the rivulets above mentioned join a stream of the same name as the town itself.—The river Bogota, otherwise called the Funcha, is in itself an object of physical interest. It is the single outlet of the waters of the table-land, which, both from geological features and from aboriginal traditions, appears to have once been a land-locked basin, somewhat like the still loftier and larger plateau of Titicaca. Be this as it may, the river B. has found, if it has not forced, a passage for itself toward the Magdalena. At the cataract of Tequendama the waters plunge over a precipice 900 ft. high; and the clouds of spray clothe the adjacent grounds in the most luxuriant vegetation. About the centre of this cataract, known as the Fall of Tequendama, stands the natural bridge of Icononzo, formed as if by the fortuitous jamming of rocks from the opposite sides of the cleft. Between the crest and the foot of this fearful torrent, there exists a difference of climate, which is obviously disproportioned to a mere difference of elevation; and the excess may perhaps be ascribed, in conjunction with the ceaseless moisture, to the wall-like precipice behind, which, besides intercepting the winds, increases by reflection the heat of the sun. Pop. of B. (1800) 21,464; (1836) officially estimated 130,000.

BOGOUSLAV, or BOGUSLAW, *bo-gô sláv'*: town of Russia, govt. of Kiew, about 70 m. s.s.e. of the city of Kiew; on the Rossa. Pop., chiefly Jews, 9,000.

BOG SPAVIN: swelling of the hock joint of the horse. It appears in two forms. In the more serious, there is inflammation of the upper part of the joint making the animal lame and liable, if not checked, to cause the deposition of a bony substance that will prevent all movement of the joint. It is caused in various ways, as by sprains, rheumatism, overwork, or accident; and is far more likely to appear in young horses than in those which are fully matured, though in the latter it is more difficult to control. The use of bandages, astringent lotions, rubbing gently with the hand, and rest for a few days will usually cause marked improvement. Blistering is often resorted to, but it is to be recommended only in severe cases and after the heat and soreness have been reduced. Even in these cases, firing with the iron at nearly white heat is more desirable; but this treatment, as well as blistering, should be by a veterinarian.—Another form of B. S. is a dropsical effusion which distends the mucous capsule of the joint and causes a swelling, but, except at its first appearance or from a subsequent injury, does not cause lameness, heat, or tenderness. The milder measures indicated for the other form of the disease usually prove beneficial, but severe exertion is likely to cause recurrence of the evil. Distention of the vein which passes over the spot at which B. S. appears, and which is often caused by that disease, is known as blood spavin. As it does not lead to serious results, no special treatment is required. See SPAVIN.

BOGUE—BOHEMAN.

BOGUE, *bōg*, DAVID: 1750, Feb.—1825, Oct.; b. Hally-down, Berwickshire: Congl. minister, founder of the London Missionary Soc. After studying at Edinburgh Univ., and obtaining his license as a preacher in connection with the Church of Scotland, he, 1771, went to London, where he was for some time a teacher. He afterward accepted the charge of an Independent or Congl. church at Gosport, where he established a seminary for the education of students for the Congl. ministry, an institution which had a great influence on the connection, as well when it had this object in view as afterward, when it became a school for the training of missionaries. B. now conceived the grand missionary scheme, ultimately realized in the London Missionary Soc. He was active in the establishment of the British and Foreign Bible Soc., and the Religious Tract Soc. On his death, an extraordinary meeting of the London Missionary Soc. was convened, to express its sense of bereavement, and of the great work which he had done for Christian missions. B. was the author of *An Essay on the Divine Authority of the New Testament*, which has had a circulation only second to that of Bunyan's *Pilgrim's Progress*, having been translated into French, Italian, German, and Spanish; also *Discourses on the Millennium*; and in connection with Dr. James Bennet, a *History of Dissenters*, from the Revolution of 1688 to 1808.

BOGUS, a. *bō'gūs* [Amer. slang—said to be from a swindler named *Borghese*]: anything counterfeit; spurious.

BOHEA, n. *bō-hē'* [from *Bouy* or *Booy*, a mountain in China]: a common black tea.

BOHEMAN, CHARLES ADOLPHUS ANDERSON: 1770–1830; b. Sweden: a mysterious person, who left his native country while very young, and returned unexpectedly in 1802, the possessor of considerable money, of which nobody knows the source. It was supposed that it was not acquired by honorable means, and he was accused, either of having stolen Marie Antoinette's jewel-case, at the time that the royal family fled from Paris (B. being then engaged as sec. to the Count de Fersen), or of having snatched from a wealthy Englishman his casket containing his money and his papers; but neither of these accusations could be substantiated. He returned to Sweden to marry a poor young girl to whom he had been betrothed before his departure. It is said of him that he was agreeable in his intercourse, and that his benevolence toward the needy and public institutions was very great. He also exercised a powerful influence over some great personages, among them Duke Charles. Fearing that he might gain the ascendancy over Gustavus Adolphus, he was represented as a man politically dangerous, and the king sent him into exile. After the revolution of 1809, B. was permitted to return; and B. soon regained credit with his old benefactor, now King Charles XIII.; but in 1814, he was again the victim of new and unjust suspicions, and was arrested and carried beyond the frontier. He protested in vain; and retired to Germany, where he spent the rest of his life.

BOHEMIA.

BOHEMIA, *bo-hē'me-a* (Ger. *Böh'men*) formerly one of the kingdoms of Europe, now forming a part of the Austro-Hungarian monarchy; in lat. $48^{\circ} 33'$ – $51^{\circ} 3'$ n., and long. 12° – $16^{\circ} 46'$ e. It is bounded n. by Saxony and Prussian Silesia, e. by Prussia and Moravia, s. by Lower Austria, and w. by Bavaria; 20,060. sq. m.; pop. (1869) 5,140,544; (1900) 6,318,697. It is divided into thirteen circles—viz., Prague, Leitmeritz, Jung-Bunzlau, Jičín, Königgrätz, Chrudim, Caslau, Tabor, Budweis, Pisek, Pilsen, Eger, and Saaz. It contains nearly 400 cities; 250 market-towns; and 650,000 dwelling-houses. B. is surrounded on all sides by lofty mountain-ranges, the principal of which are the Riesengebirge (part of the Sudetic chain) on the n.e., dividing B. from Prussia and Silesia, and attaining, in the peak of the Schneekoppe, a height of 5,275 ft.; on the n.w., the Erzgebirge, with a height in some places of more than 4,000 ft.; on the s.w., the Böhmerwald, reaching in its highest point 4,613 ft. Offsets from these traverse the interior of the country, which has an undulating surface, sloping generally to the centre. B. has several fine valleys, chief of which are those of the Moldau and the Elbe. The country belongs to the upper basin of the Elbe, which rises in the Riesengebirge range; and it is well watered by the affluents of that river, the principal of which are the Moldau—which has its source in the Böhmerwald (or Bohemian forest, covering the mountain boundary between B. and Bavaria and separating the basins of the Elbe and the Danube), and which is navigable from Budweis to Melnik, where it joins the Elbe, a distance of 148 m.—the Eger, Iser, Aupa, Metau, Biela, and Erlitz. B. has no lakes of any considerable size.

The climate of B. is cold in the mountainous regions, the higher peaks being covered with snow during a great portion of the year, but mild in the valleys, and, on the whole, healthful.

The mineral wealth of B. is varied and extensive, consisting of silver, tin, copper, lead, iron, cobalt, alum, sulphur, graphite, calamine, cinnabar, porcelain clay, with several precious and ornamental stones, such as Bohemian garnet (*Pyrope*), rubies, sapphires, etc. Of coal, B. produces more than all the rest of the Austrian empire together. It also yields a large supply of asphaltum. Mineral springs are abundant, and those of Carlsbad, Marienbad, Eger-Franzensbad, Teplitz, Elisenbad, etc., are celebrated places of resort.

The soil of B. is generally fertile. More than one-half of the area consists of arable land; nearly one-eighth is laid out in meadows and gardens; pastures form about a twelfth; vineyards, a very small portion; and forests cover nearly a third. The wheat raised in B. is about a seventh of the produce of the whole Austrian empire. The rye, barley, and oats are, the first a fourth, and the latter two a sixth of all the produce of these kinds of grain. This indicates great agricultural importance to the country, in relation to the Austro-Hungarian empire. Flax and hops are important products in a manufacturing

point of view; the yearly crop of flax amounts to 200,000 cwts. Bohemian hops are famous, and 50,000 cwts. are on an average produced yearly. A great variety of fruit is cultivated and exported in large quantities. The culture of the vine is confined to the vicinity of Prague and the lower part of the Elbe.

Various kinds of game are found, and the breed of pheasants is celebrated. Horned cattle, sheep, goats, and swine are reared extensively in some districts; and in the south, geese form an important item in the resources of the country.

In manufactures, B. holds a very high place among European countries. It is the chief centre of dyeing and calico-printing. The linen manufacture, more extensive than that of all the other Austrian provinces together, consists of damask, cambric, lawn, and other fine varieties, in addition to the ordinary qualities of cloth. Of the 403,000 spindles employed in flax-spinning in the empire, Bohemia reckons 260,400. The chief seat of the woolen-manufacture is Reichenberg and its neighborhood. Another important branch of industry is the paper-manufacture, of which B. possesses more than the half. The glass-works of B. are celebrated, and very numerous and extensive, affording employment to thousands. Beet-root sugar is manufactured extensively, and there are hundreds of breweries and brandy distilleries throughout the country, but mostly on a small scale. The manufacture of iron is considerable. The position of B. secures it a large transit trade. Steam-packets ply on the Elbe and Moldau; the horse-railway which, till 1869, connected these rivers at Budweis and Linz, was the oldest on the continent. B. has good roads, and there is an excellent system of railways centring in the capital, Prague.

Population, Religion, and Education.—The Czechs, a Slavonic race, form the bulk of the people. They are abt. 3,510,500, and dwell chiefly in the centre and e. of the country. The Germans, abt. 2,232,000, reside mainly on the outskirts, especially in the n.e. The great majority of the total pop. of 6,318,697 belong to the Rom. Cath. Church, but other religions are tolerated; the Protestants amount to only 120,000, and the number of Jews is about 100,000. The Rom. Catholics are under the supervision of the Abp. of Prague, and the three Bps. of Leitmeritz, Königgrätz, and Budweis. The monasteries and convents number between 120 and 130. Education is much more widely diffused than in any of the other provinces of Austria. The educational establishments include the Univ. of Prague, 20 gymnasia, and 30 other higher schools; besides 4,550 public schools. B. sends 110—about a fourth of the 425—members to the lower house of the Austrian reichsrath, or parliament of the w. part of the empire.

History.—The *Boii* (q.v.), from whom B. derives its name, settled in the country B.C. 2d c., but were expelled by the Marcomanni about the beginning of the Christian era. The victors themselves soon gave place to others, and as early as the 5th c. B. was peopled by the Czechs,

BOHEMIA.

a Slavic race. In the latter part of the 9th c., Swatopluk, the king of Moravia, subjugated Bohemia and introduced Christianity. After his death, the dukes of Prague, who in 1061 had the title of king conferred on them by the emperor Henry IV., ruled the country as a state in the German empire until 1306, when the last of the dynasty was assassinated.

From 1310 to 1437, B. was ruled by kings of the House of Luxemburg. In the time of Wenzel IV. (Wenceslas), a reformation of religion took place under John Huss (q.v.) and Jerome of Prague (q.v.). After the death of Wenzel IV., the imprudent measures adopted by the emperor Sigismund excited in B. a war of sixteen years' duration, which ended in making B. an elective kingdom. In 1458, the shrewd and able Protestant noble, George von Podiebrad, ascended the throne. His successor, Ladislaus (1471-1516), was elected (1490) to the throne of Hungary, and removed the royal residence to Ofen, where also his son and successor, Lewis (1516-26), resided. After his death in battle against the Turks at Mohacz (1526), B. and Hungary passed into the hands of Ferdinand I. of Austria, who had married Lewis's sister. From that time, the history of B. merges in the history of Austria (q.v.).

Bohemian Literature.—The Czechs of B. possess a literature older than that of any other people of the Slavonic stem. Its origin may be dated with certainty as early as the 10th c. Of the oldest period—or before the time of John Huss the reformer—21 poetical and more than 50 prose works are extant. Among the former, the remains of a collection of ballads, etc., made in the 13th c., are remarkable for poetical merit. John Huss in B., like Luther in Germany, began a new era in literature (1409-1526); but the impulse of his example was far more important than his own writings. The literary remains of the Hussite sects in the 15th c.—dogmatic, polemic, and ascetic works—are still numerous in the old libraries and archives of B., though very many of them perished in the flames kindled by the Jesuits during the Thirty Years' War. Even so late as 1750, the Jesuit, Antony Konias, boasted that he had burned 60,000 Bohemian books. Of historical works of this period, some remains have been edited by Palacky in his *Scriptores Rerum Bohemicarum*, 1829.

The period 1526-1620 is regarded by the Bohemians as their golden age of literature. In this time, especially under Rudolf II. (1576-1611), the arts and sciences were generally cultivated. Prague had two universities and sixteen schools, and the Bohemian language had reached its highest cultivation. It cannot, however, be said, that the literary works of this period display any great originality of genius. Among the most noticeable is a Bohemian translation of the Bible, finished in 15 years by eight scholars, assembled by John of Zerotin at his castle of Kralic, in Moravia, and published 1579-93. It is a model of pure and elegant Bohemian.

In 1774, Dec., an imperial decree was issued, ordaining that the German language should be employed by all

BOHEMIAN BRETHREN.

teachers, lecturers, etc., in the upper schools. This harsh measure excited considerable opposition; and several writers came forward to vindicate the claims of the persecuted dialect, and to develop its powers; but their efforts had small success.

A new and better era began, 1818, with the discovery of valuable remains of old literature, and the publication of edicts favorable to the use of the Bohemian language in schools. Since that time, the progress of the language, as a vehicle of literature and science, has been rapid, and a love of the old dialect has been extended through all classes of society. In Bohemian poetry and belles-lettres, the names of Czelakowsky, Kollar, Holly, Langer, and Schneider, are distinguished. Among scientific writers, mention may be made of Jungmann, Schafarik, Wenzel Hanka, and Presl. In history and archeology, the names of Palacky, Tomek, Schafarik, and Wocel are worthy of notice. Papers entirely political and of mixed politics and literature circulate more largely in B. than in any other part of the empire. In 1875, 108 papers were published in Bohemian, 11 daily. Since 1831, a committee for the cultivation of Bohemian literature has been in existence. Several important works, among them Schafarik's *Slavonic Antiquities*, and Jungmann's *Large Lexicon*, and his *Literary History*, have been published by aid of the committee.

The *Bohemian language*, harshest and strongest of the many dialects of the Slavonic family, is one of the best dialects of the West Slavonic; it is spoken not only in B., but also in Moravia, and among the Slovaks in Hungary. Among its sister-dialects, it is distinguished by copiousness of root-words, great flexibility in combinations, precision, and accurate grammatical structure; but, like all the Slavonic and most modern dialects, it has no specific form for the passive voice of the verb. The orthography introduced by John Huss in the 15th c. is precise and consistent with itself. Every letter of the Roman alphabet has its one distinct sound. Bohemian prosody is distinguished from that of most European languages by the use of quantity instead of accent, so that it can copy faithfully all the ancient Greek and Roman metres. No other modern language can translate the ancient classics so readily, and yet so completely and forcibly, as the Bohemian. Its grammatical forms are complicated and difficult.

BOHEMIAN BRETHREN: a religious society instituted in Prague about the middle of the 15th c.; originally composed of remnants of the Hussites. Dissatisfied with the conduct of the Calixtines (q.v.), they betook themselves, 1453, to the borders of Silesia and Moravia, where they settled. Here they dwelt in separate communities, and were distinguished by the name of Brothers of the Rule of Christ. Their adversaries often confounded them with the Waldenses and Picards, while, on account of their being compelled during persecution to hide in caves and solitary places, they were also called Cave-dwellers (*Grubenheimer*). In spite of oppressions, such was the constancy of their faith and purity of their morals that they became profoundly

BOHEMIANS—BOHEMOND I.

respected, and their numbers greatly increased. The chief peculiarity of their creed was the denial of the ordinary Rom. Cath. doctrine of transubstantiation; but, in truth, they rejected tradition generally, and professed to found their tenets only on the Bible. Their ecclesiastical constitution and church-discipline—of which the Lutheran reformers spoke highly—was an imitation of that of the primitive Christian communities. They even went the length of practically denying anything to be secular; and, under the impression that religion should consciously penetrate and characterize the entire life of men, they extended ecclesiastical authority over the very details of domestic life. Their chief functionaries were bishops, seniors and conseniors, presbyters or preachers, ædiles, and acolytes. Their first bishop was consecrated by a Waldensian bishop, though they never united themselves with the Bohemian Waldenses. It was against their principles to engage in war; and having, on several occasions, refused to take up arms, they were at last deprived of their religious privileges. The result was that, in 1548, about a thousand of the Brethren removed to Poland and Prussia. The contract which these exiles entered into with the Polish reformers at Sandomir, 1570, Apr. 14, and, still more, the religious peace concluded by the Polish states in 1572, secured their toleration; but subsequently, in consequence of the persecutions of King Sigismund III., they united themselves more closely to the Protestants, though even at the present day they retain something of their old ecclesiastical constitution. The Brethren who remained in Bohemia and Moravia obtained a little freedom under the emperor Maximilian II., and had their chief seat at Fulnek, in Moravia. In the 17th c. a number removed into Hungary, but during the reign of Maria Theresa were coerced into Rom. Catholicism. The Thirty Years' War, so disastrous to the Bohemian Protestants, entirely broke up the societies of the Bohemian Brethren; but afterward they united again, though in secrecy. Their exodus about 1722 occasioned the formation, in Lusatia, of the *United Brethren*, or *Herrnhuters*: see MORAVIANS.

BOHEMIANS, n. plu. *bō-hē'mě-ānz* [as if from *Bohēmāā*, and so a sort of outcasts]: gypsies; impostors; literary men and artists of loose and irregular habits, who have consequently lost caste; formerly used to designate some followers of John Huss in Bohemia in 15th century; also applied to the Moravian Brethren.

BOHEMOND I., *bō'he-mōnd*, Prince of Antioch: abt. 1056–1111; eldest son of the Norman conqueror of Apulia and Calabria, Robert Guiscard. In his youth he distinguished himself in his father's war against the Byzantine emperor, Alexis Comnenus (1081–85). After his father's death, he was excluded from the throne of Apulia by his brother Roger, and only gained the principality of Tarentum after a long contest. He joined the crusade of 1092 with a large army—most of which he had won over from his brother's service—and was conspicuous in the fight of Dorylæum, in Cilicia, 1096, and at the capture of Antioch,

1098. While the other Crusaders advanced to storm Jerusalem, B. remained in Antioch, where he established himself as prince. Being soon after besieged, the Christians, reduced to extremities, came out, and gave the sultan battle, and entirely routed his forces, B. greatly distinguishing himself in the fight. He was afterward made prisoner by a Turkish emir, and remained two years in captivity. Tancred, meanwhile, looked after his interests in Antioch. B. returned to Europe to collect troops, and after defeating Alexis in several engagements, was acknowledged by that emperor as Prince of Antioch. He died in Apulia.

BOHEMOND II., Prince of Antioch: son of B. I.; a minor at the death of his father; assumed the government of Antioch, 1126 (after Tancred had been regent for some years), and was killed in battle, 1130.

BOHEMOND III., grandson of B. I., was allowed to retain sovereignty only by the clemency of Saladin, and died 1201.—B. IV. (1233–51) and B. V. (d. 1275) were insignificant princes; and with B. VI. the Christian dynasty in Syria was brought to a close.

BÖHME, *bö'méh*, or BÖHM, *böm*, JAKOB: 1575–1624, Nov. 27; b. of poor parents at Altseidenberg, near Görlitz, Upper Lusatia: German mystic and theosophist. He spent his boyhood in tending cattle, receiving no instruction till he was ten years of age; but even then, the contemplation of earth and sky had so excited his naturally pious imagination, that he conceived himself inspired. He learned the trade of a shoemaker, but continued to devote much of his time to meditation on divine things. About 1612 was published his first book, called *Aurora, or the Morning Redness*. It contains revelations and meditations upon God, Man, and Nature; shows a remarkable knowledge of Scripture, especially of the apocalyptic books; as also a familiarity with the writings of the mystico-philosophic alchemists. It was condemned by the ecclesiastical authorities of Görlitz; but the persecutions to which its author was subjected had not the effect of convincing him of error. B.'s fundamental speculation is, that the forthcoming of the creation out of the divine unity—which is itself distinguishable into a trinity—can be contemplated by mystic illumination, and expressed in words. The object of his mystic contemplation, accordingly, is two-fold: first, God himself apart from creation, or, to use some of B.'s own synonyms, the groundless, the eternal One, the silent nothing, the *temperamentum*; and, secondly, the forthcoming of the creature out of God. This forthcoming of the creation, which is also an in-going of the silent nothing, is, according to B., the principle of negation, and he calls it 'contrariety.' 'All things,' he says, 'consist in Yes and No. The Yes is pure power and life, the truth of God, or God himself. The No is the reply to the Yes, or to the truth, and is indispensable to the revelation of the truth. So, then, the silent nothing becomes something by entering into duality;' and so on into what to most minds will seem utter unintelligibility. Numerous attacks from

theologians disturbed B.'s last years, but he bore them all with great meekness. They were probably occasioned by a tract on repentance which his friends had printed without his knowledge; and so great was the interest excited, that he was induced by the solicitations of certain courtiers and of his friends to visit Dresden for the purpose of having his doctrines investigated. The court applauded and protected him. On returning to Görlitz, he took ill, and died. The first collection of his writings was published by Betke (Amsterdam, 1675); the most complete in 1730, at the same place; and the latest (1831-46) by Schiebler, at Leipsic. Next to Germany, Holland and England are the countries in which B.'s works have been received with most favor. In England, where B. was generally called Behmen, a translation in 2 vols. quarto was published, 1764. Sir Isaac Newton studied him; William Law of Oxford might be called his disciple; in 1697, Jane Lead, a fanatical disciple of B., founded a sect, called the Philadelphists, for the exposition of his writings; and John Pordage, a physician, also is famed among his English interpreters. Abraham von Frankenberg, (d. 1652), published the earliest biography of Böhme. In modern times, and in connection with speculative philosophy in Germany, his views, which had come to be regarded as empty mysticism, have acquired fresh interest and importance. This arises from the kindred character of his fundamental principle with the spirit pervading the systems of Spinoza, Schelling, and Hegel. The intellectual contemplation of the absolute, out of which the contradictions in the world of phenomena proceed, and into which they return, is common to these systems and to B.; Hegel, indeed, expressly represents B.'s negativity, the active principle of development, as an obscure foreshadowing of his own intuitions, and on that account places him at the head of modern philosophy. The terminology of his philosophy, as will be seen from what we have quoted, is fantastic; but his imagination often conceives splendid ideas, which are more profoundly appreciated, and are the source of richer and more fruitful suggestions, in the 19th than they were in the 17th c. See Hamberger's (1844), Fechner's (1857), Peip's (1860), Harless's (1870), and Martensen's (1882) works on B. and his philosophy.

BOHN, *bön*, HENRY G.: 1796, Jan. 4—1884, Aug. 22; b. London, of German parentage: author, translator, and publisher. It is impossible to estimate too highly his services to the community by republishing, at a cheap rate, a vast number of the most valuable works in literature, science, philosophy, theology, etc. Such collections as the Standard Library (130 vols.), the Scientific Library, Library of French Memoirs, the Illustrated Library, the Classical Library (translations of the Greek and Latin authors), the Antiquarian Library, the Ecclesiastical Library, etc., contain the intellectual wealth of both the ancients and moderns. He also obtained distinction as the editor of the *Bibliotheca Parriana*, of Lowndes's *Bibliographer's Manual*, etc., and as translator of Schiller, Goethe, and Humboldt. He com

piled a *Polyglot of Foreign Proverbs*, Handbooks of Games and Pottery, and a *Dictionary of English Poetical Quotations*.

BOHOL: one of the Philippine Islands, belonging to the Visayas or Bisayas group. It has an area of about 1,300 sq. m. and an estimated population (1901) of 260,000. The interior of the island is mountainous. The coasts are low and sandy, and as a general rule do not offer security to ships. Sugar-cane, rice, coffee, tobacco, cotton, and other agricultural products are grown, and it is reported that there are rich gold deposits. The most important town is Tagbilarian, a port on the s.w. coast. In the n. is Calape. These ports were officially declared open to commerce 1899, Dec. 11.

BOIAR, *boy'ár*: word originally of the same meaning as Czech, Lech, and Bolgarin, i.e., free proprietor of the soil. The Boiars, in old Russia, were the order next to the knjazes or knjeses (ruling princes). They formed the immediate 'following' of these princes, and bore somewhat of the same relation to them as the less important English and Scottish knights of the feudal ages did to the great barons Percy, Douglas, etc. They had their own partisans, who served them as a kind of body-guard; they gave their services to a prince of their own choice, whom, however, they left again at their pleasure, and, in consequence of this, the knjazes could secure their allegiance only by the bestowment of privileges often abused. They held exclusively the highest military and civil offices, and were so universally looked up to by the mass of the people, that the most powerful rulers, even Ivan the Cruel, considered it prudent to use this form of expression in their ukases: 'The Emperor has ordered it; the Boiars have approved it.' Rank among the Boiars was always proportioned to length of state-service, and was observed with the utmost rigor, so that the B. who had obtained an office, as it were, yesterday, looked down with contempt on him who entered on his only to-day. This singular mode of securing gradation of rank was called *miestniczestwo*. It was a peculiar phenomenon of Slavic life, equally unlike feudalism and modern aristocracy, and must be regarded as a strictly national development. In their housekeeping the Boiars were excessively fond of splendor, and their contempt for the serfs or 'lower orders' was immeasurable. In the lapse of time, many Chinese customs—as might be expected from their theory of rank—crept into their public life. Their power, and the respect which was paid them, acted as a wholesome check upon the otherwise unbridled authority of the princes; in consequence of which, the latter became their bitter enemies, and often sought to destroy their power. This was finally done by Peter the Great, who abolished the order of Boiars by giving them a place among the Russian nobility, but, at the same time, stripping them of their peculiar privileges. The last Russian B., Knjaz Ivan Jurjewicz Trubeckoj, died 1750, Jan. 16.

In Moldavia and Walachia, Boiars still exist. They have a seat and vote in the council of the prince, and, as

recent history shows, exercise at times an extensive influence.

BOIARDO, *bo-yar'do*, **MATTEO MARIA**, Count of Scandiano: 1430 (or 34)–1494; b. Scandiano, It.; celebrated Italian poet. After completing his studies at the Univ. of Ferrara, he was introduced at the court of Duke Borso d'Este, by whose successor, Ercole I., he was promoted to several honorable offices. In 1478, he was made gov. of Reggio; in 1481, gov. of Modena; and six years later, he again became gov. of Reggio, where he died. His chief work is the romantic chivalrous poem, *Orlando Innamorato*, which he left unfinished in three books. Former writers had described Orlando only as a cold, pure champion of Christendom; but B. introduced a romantic charm in the element of love—thus bringing his conception nearer to the reality of history. B. furnished to all his poetical successors the personages who figure in their adaptations of the old romance; particularly to Ariosto, whose *O. Furioso* is a continuation of B.'s poem. His work was printed first in 1486, and 16 times before 1545, and was translated into French and Spanish. From the dialect of the court of Ferrara, new versions unsatisfactory to the Florentines, were made (1541 and 1545) by other hands. Finally the original text was published with the critical observation the original text was republished with critical observations by Panizzi (9 vols. Lond. 1830), and afterward by Wagner (Leip. 1833). The other works of B. include *Sonetti e Canzoni* (Reggio, 1499); *Il Timone*, a five-act comedy (1500); *Cinque Capitoli in Terza Rima* (1523); and *L'Asino d'Oro*, a metrical version of the *Golden Ass* of Appuleius (1523); besides a translation of Herodotus (1533), and of Riccobaldi's *Chronicon Romanorum Imperatorum*. B. was a man of amiable and benevolent disposition.

BOIELDIEU, *bwål-de-eh'* **ADRIEN FRANÇOIS**: 1775–1835, Oct.; b. Rouen: French musical composer. At the age of 18 he produced a one-act opera in his native town. In 1795 he went to Paris, and was elected prof. in the Conservatoire de Musique when it was established. In 1803, he was appointed by the emperor Alexander of Russia, chapel-master at the imperial court. After eight years in Russia, during which he produced several operas, he returned to Paris, where he brought out his most popular piece, *La Dame Blanche*; also *Jean de Paris*, *Le Petit Chaperon Rouge*, etc. At his death in Paris, the nation honored him with a public funeral; his native city claimed his heart, voting 12,000 francs for the pomp of its reception in the cathedral. The govt. granted his son a pension.

BOIES, *boyz*, **HORACE**: b. Aurora, Erie co., N. Y., 1827, Dec. 7———. After practicing law in Buffalo, N. Y., he settled in Waterloo, Ia., 1867, as a lawyer and a farmer on a large scale. He was a republican till 1886, then became a democrat, and was elected gov. of Iowa 1889, re-elected 1891, and the first democratic gov. since 1854. In the canvass, the question of 'prohibition' was foremost; he advocated the canceling of the prohibitory law of Iowa and stringent regulation of the liquor business instead. He was renominated for gov. 1893, and was defeated.

BOII—BOIL.

BOII, *bō'ī-ī*: a Celtic people who at a very remote period seem to have inhabited either the s. part of Belgium, or a portion of France in its immediate vicinity, whence they emigrated to Italy. Having crossed the Po, they established themselves in the territory of the Umbrians, between the Po and the Apennines, and for some hundreds of years waged a fierce war with the Romans. They were defeated at the Vadimonian Lake, B.C. 283; at Telamon, Etruria, B.C. 225, during the great Gallic war, of which they were the original cause; rushed into rebellion on hearing of Hannibal's march, joined him at the battle of the Trebia, B.C. 218, destroyed the entire army of the consul Postumius, B.C. 216, were prominent in the revolt of the Gauls under Hamilcar, and in the destruction of Placentia, B.C. 200; but at length, B.C. 191, they were completely subdued by Scipio Nasica, who, besides killing a vast number, took from them nearly one-half of their land. At a later period, they were dispossessed of the whole, and driven across the Alps. Their subsequent history and geographical position are not very clear. Those who settled s. of the Danube were, after a century, exterminated by the Dacians; those who returned to Gaul were destroyed by Cæsar. The most important migration of the B., however, was that to the n. of the Danube, where they founded the extensive kingdom Boiohemum, which was overthrown by the Marcomanni under Marbod. But though the dynasty of the B. was thus destroyed, the kingdom retained the name Boiohemum—i.e., home of the B., whence comes the modern Böhmen, or Bohemia.

BOIL, v. *boyl* [Gael *boile*, madness, rage: Icel. *bullu*, to bubble up; *bola*, a bubble: F. *bouillir*, to boil: Dut. *bol*, swelling: Ger. *beule*, a tumor, a boil: L. *bullu*, a bubble]: to bubble as water by heat; to be converted into vapor or steam by heat; to swell; to heave; to be agitated or moved violently by any cause; to dress or cook in water. **N.** a tumor upon the flesh; a sore inflamed swelling; an abscess. **BOILING**, imp.: **N.** the act of bubbling by heat: **ADJ.** dressing by hot water. **BOILED**, pp. *boyled*: **ADJ.** cooked in water, as meat. **BOILINGLY**, ad. *-lī*. **BOILER**, n. a vessel in which any liquid is boiled; that part of a steam-engine in which the steam is generated. **BOILERY**, n. *-ēr-ī*, the boiler-house in salt-works. **BOILER-CRUST**, the fur or deposit of lime-salts occurring in boilers when hard water is used. **BOILER-IRON**, or **BOILER-PLATE**, n. rolled iron of $\frac{1}{4}$ to $\frac{1}{2}$ inch thickness, used for making steam-boilers, tanks, the skin of ships, etc. **BOILER-PROVER**, in *hydraulics*, a force-pump with pressure indicator, used to try the power of a boiler to resist rupture under a given stress of hydraulic pressure. **BOILING-POINT**, the degree of heat at which water or any other liquid bubbles up and gives off vapor or steam freely, the point in water being 212 Fahr. **AT THE BOILING-POINT**, exceedingly angry. **TO BOIL OVER**, to run over the vessel with heat, as a liquid. **TO KEEP THE POT BOILING**, to keep going on actively, as dancing, festivities, etc.; not to allow to flag. **A BLIND BOIL**, one that does **not** come to a head.

BOIL—BOILEAU DESPRÉAUX.

BOIL: a hard painful swelling of the skin. It begins as a small hard point of a dusky red color, which is hot, painful, and throbbing. This point extends, and these symptoms increase in severity till about the sixth to the ninth day, when it ceases to enlarge, is of a conical form, with a broad firm base, and on the apex a whitish blister, which contains a little ; pus ; this opens, and after a few days more there is discharged a core or slough of cellular tissue, and the small cavity left heals rapidly, leaving a white depressed scar.

Many kinds of boils have been described, but they may, like other diseases of an inflammatory nature, be divided into those which are *acute* and run a rapid course, as above described; and the *chronic*, which take three or four weeks to 'come to a head.' Boils are most common in the spring, and in young and plethoric persons, and their appearance is quite consistent with robust health. Men in training for boat-races, or others who have suddenly changed their diet and daily habits, are said to be very subject to them. There is a form of B. which generally occurs on the back of the neck, after some disorder of the stomach, in elderly people, hence it is called 'Old People's Boil.' In some, boils continue to succeed each other for a length of time; others are attacked during the night, after having experienced feelings of nausea and languor, by pustules, which are called night-boils (*epinyctis*).

The treatment of boils varies with the subject of them: in many, they are merely critical—in other words, a natural effort 'to relieve some functions of the body by a peculiar inflammation of the skin.' The intestinal canal should be cleared out by laxative medicines, and the digestive powers improved by tonics and antacids. The skin should be kept healthy by frequent washing, while the inflamed spot should be poulticed with poppy-heads or hemlock, mixed with other materials. Wet lint is a sufficient application after the core has been thrown off. If the patient chooses to submit, however, to a momentary pain, he will have the greatest, most permanent, and immediate relief from a cut carried quite through the boil. John Hunter, the great surgeon, made riddance of habitual boils by taking repeated doses of soda in milk.

BOILEAU DESPRÉAUX, *bwá-lō' dǎ-prā-ō'*, **NICOLAS**: 1636, Nov. 1—1711, Mar. 13; b. near Paris: poet. In 1660 he produced the fine satire, *Adieux d'un Poète à la Ville de Paris*. In 1666, he published his seven *Satires*, afterward increased to twelve, of which the eighth and ninth are considered the best. In these satires, B. even ventures to castigate the *coryphæi* of the world of letters—Chapelain, Cotin, Scudery, etc. To his honor, however, it must be said that malice does not once animate his pen; he is always pleasant and gay, never cruel. His contemporaries are his laughing-stocks, not his victims. From 1669–96 appeared his *Twelve Epistles*, indicating a ripened genius. The versification has more ease and grace; the style, a quicker movement and a firmer consistency: the thoughts

are more vigorous, and more strictly concatenated; everywhere are greater truth, color, and energy. The one addressed to Racine, who, with B., filled the office of royal historiographer, is reckoned among the finest. In 1674, B. published *L'Art Poétique*, accompanied by a translation from the Greek of *Longinus on the Sublime*, and the greater part of *Lutrin*. These are by many French critics considered his *chefs-d'œuvre*. The first is indeed exquisite, and is copiously imitated in Pope's *Essay on Criticism*. It lays down rules for almost every species of poetry, in a clearer and more methodical manner than had ever been done before, while the whole poem is sprinkled with touches of delicate satire. The second, *Lutrin*, is a comic epic in six cantos, immensely admired by his countrymen. Besides these, B. wrote several minor pieces, in prose and in verse, such as—*Dialogue des Héros de Roman*, *Dissertation sur Joconde*, *L'Arrêt Burlesque*, and *Discours sur la Satire*. Many of his letters have been collected. Among them are 20 to Racine. The letters of B. are in general extremely valuable, as they contain a large proportion of the literary history of the time. They also show his character as high-minded, generous, and pure. In fact, his impulsive disposition and imprudent warmth of heart quite contradict the common notion of what a satirist is. When Corneille's pension was ordered to be stopped, after the death of Colbert, B. hastened to the king, remonstrated against so 'barbarous a spoliation,' and threatened to resign his own, if the decree were carried into effect. He courageously denounced the persecutors of the nuns of Port Royal; expressed his admiration of Arnauld, when the latter was on the point of being arrested; extricated from pecuniary embarrassments many friends; and, through kindness of heart, forced a reconciliation with various of his literary adversaries. An admirer of Pascal, and a friend of the Jansenists, he could yet render homage to the talents of such Jesuits as Bourdaloue, Bonhours, and Rapin; but his most intimate and cherished companions were Molière, Racine, and Lafontaine. Until 1706, B. lived much in public, but after that his bodily infirmities induced him to retire to Auteuil. B.'s influence on French literature has been immense, and, on the whole, beneficial. Voltaire proclaimed him 'the legislator of Parnassus.'

BOILER.

BOILER, in Mechanics: a vessel in which steam, usually for a steam-engine, is generated. In its simplest form, it consists of a close vessel of metal plate, having apertures for the admission of water and egress of steam, fitted with apparatus for showing the level of the water and the pressure of the steam, and in connection with a furnace, either internal or external. When water is boiled in an open pan, the temperature of the water and of the steam rising from it, remains at or very near 212° F., and the tension or pressure of the steam is no more than sufficient to make its way into the atmosphere, being exactly equal to that exerted in all directions by the atmosphere itself—namely, 14.7 lbs. per sq. inch. In a close vessel, on the other hand, the temperature and pressure to which steam can be raised are limited only by the strength of the vessel or B. against bursting.

The form of a B. is determined by two considerations—strength to withstand internal pressure, and efficiency in producing steam; and the object of the designer is to combine in one apparatus sufficient strength to work safely at the proposed pressure, with such a form and arrangement as shall abstract the maximum of heat from the gases of combustion, and at the same time be suitable to all the special circumstances of the case. The globular form is that best adapted for strength, and was the earliest used. It presents to the fire, however, the minimum area in proportion to its contents, and therefore has a minimum efficiency. After spherical boilers, cylindrical ones came into use, at first set on end, afterward laid on their sides; and later on, these were furnished with internal cylindrical tubes for furnaces. Watt's 'wagon boiler' (so called from its shape) was used for many years, but being quite unfit for any but the lowest pressures, it has long been discarded; and the 'egg-end' boiler, or plain cylinder with hemispherical ends, also much used at one time, has now almost disappeared on account of its small evaporative efficiency. At present, it is quite common to use a working steam-pressure of 60–80 lbs. per sq. inch in ordinary factory boilers, and in some cases this is greatly exceeded, while the tendency to use higher pressures seems to grow yearly. Under these pressures, the only forms of boiler which can be used without heavy and expensive internal stays to prevent the danger of bursting, are the globular and the cylindrical. The former shape is rejected for the reason already given, and the latter form is used almost invariably in the construction of modern boilers, as is seen in the examples given below. The ends of the cylinders, when it is necessary to make them flat, must, of course, be strengthened by stays.

Boilers may be classified in several ways—as (1) Horizontal and Vertical; (2) Internally and externally fired; and (3) Plain, Multitubular, and Tubulous. Large boilers are almost invariably horizontal, but small vertical boilers are often used. They are employed in steam-cranes (q.v.) and other situations where great length would be an inconvenience, and often in traction-engines, where

steep inclines have to be traversed, and where, if a locomotive boiler were used, one or the other end of its tubes might become uncovered, and so be burned. When moderately good fuel is used, boilers with an internal furnace are generally preferred; but where the inferior brown coal is used, as on the continent of Europe, boilers are for the most part fired externally. This is because a larger quantity of the inferior fuel is required for a given volume of steam; this involves having a much larger grate than could be conveniently arranged inside the boiler. Under the head of 'plain' boilers come all ordinary cylindrical boilers, with or without internal furnaces, horizontal or vertical. They are the cheapest and simplest which can be made, and, if properly proportioned, have considerable evaporative efficiency. When it is necessary, however, to economize fuel, or space, or both, 'multitubular' boilers are used. These derive their name from the fact that in them the flame and gases of combustion are made to pass through a great number of small tubes (surrounded by the water) on their way to the chimney. The steam-generating power of a boiler depends greatly on the extent of surface which it presents to the flame, and it is obvious that a great number of small tubes present a much larger surface than one large tube occupying the space of them all. Thus, with the same heating surface, a multitubular boiler will occupy much less space than a plain one, and at the same time the efficiency of its surface is found to be greater. It is, however, necessarily more expensive and more liable to become out of order. Tubulous boilers differ from multitubular boilers in not only containing tubes, but *consisting* of them, and having no large cylinders whatever. Their chief advantages are (*a*) their great strength, for it is easy to make a wrought-iron tube strong enough to withstand pressures far higher than any at present in use; and (*b*) the peculiarity that, if any accident happens, or explosion occurs, it will only be to one tube at a time, and not to an immense boiler shell (as with the common boiler), and its evil consequences will thus be greatly reduced. For this reason tubulous boilers are often called 'safety' boilers. There is no distinct demarcation between the three classes of which we have been speaking, but on account of the immense variety of boilers which have been designed and constructed, those of one class pass through gentle gradations into those of the next.

The commonest form of boiler for factories, etc., is that known as the *Cornish*, shown in fig. 1. It consists simply of a cylindrical shell, *a, a*, inclosing a much smaller cylinder, *f, f*, called a *flue*. The ends of the flue are open, but the space between it and the shell, which contains the water, is of course closed up and made steam-tight. The fire-grate, *d*, is in the interior of the flue, and at the end of it is a brick bridge, *e*, made so as to cause the flame to impinge on the upper side of the flue. The boiler is set in brick-work; and the flame, passing out at the back end of the flue, is made to traverse the whole length of

BOILER.

the boiler twice through brick flues before passing away to the chimney.

The Cornish boiler has often two internal flues or tubes, which is a much more advantageous construction than that shown in fig. 1. The *Galloway* boiler (named from its inventor) is an excellent modification of the Cornish, which in outward appearance it exactly resembles. It

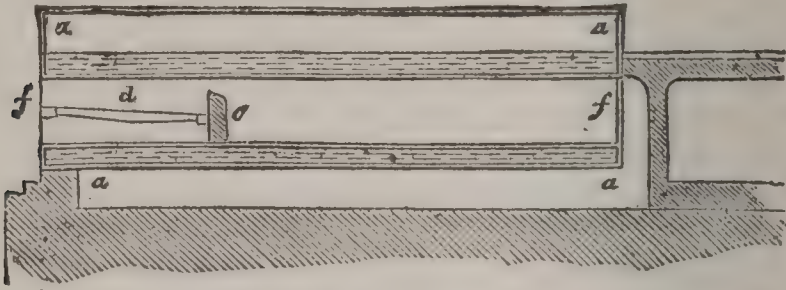


Fig. 1.

has two furnaces, but these join together in one chamber just behind the bridges, and the gases are made to pass through a space considerably narrowed by side *pockets* projecting inwards in order that they may be well mixed. From this point to the back of the boiler there is just one flue, made oval in section, and crossed by a considerable number of vertical taper tubes, which form a direct communication between the water beneath and that above the flue. These tubes (called 'Galloway tubes') both promote circulation and strengthen the flue. Multitubular boilers of many kinds are used, both for stationary engines and other purposes, but the largest number of those constructed are certainly for steamers, and a common type of marine boiler is shown in fig. 2. The shell, *a, a*, is cylindrical,

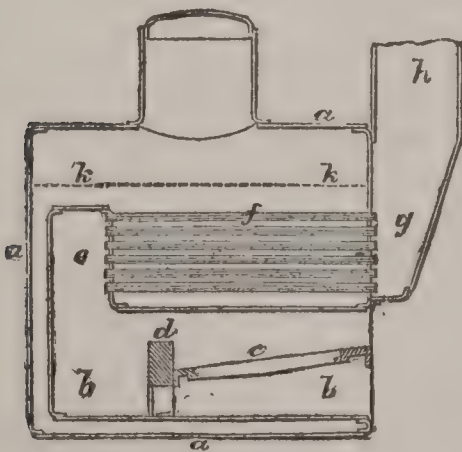


Fig. 2.

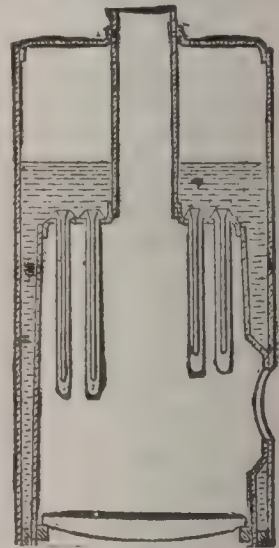


Fig. 3.

and contains one or more cylindrical furnaces; *c* is the fire grate; *d*, a brick bridge; *e*, a combustion chamber or flame-box; *f*, the tubes through which the flame passes back to the front of the boiler; and *g*, the smoke-box at the base of the funnel *h*. The line *k, k*, shows the ordinary level of the water in the boiler. On board ship it is

BOILER.

of course an object to take up as little space as possible with the boiler and machinery, and at the same time to have boilers which shall use as little coal as possible, both because of the saving in cost, and because of the saving in the room taken up by coal. For all these reasons marine boilers are invariably multitubular.

The varieties of vertical boilers are as numerous as those of horizontal. When dirty water, or water containing much insoluble sediment, has to be used (as e.g. in steam-cranes frequently), they are of the simplest construction, with nothing but an inner fire-box and an outer shell (both cylindrical), the space between them being filled with water all round and over the top of the fire-box. If clean water can be had, however, and it is desired to be at all economical of fuel, some kind of multitubular vertical boiler must be used, and of these probably the best is that known as the *Field* boiler, shown in fig. 3. The peculiarity of it consists in the tubes, which are closed at the bottom, and hang down from the top of the fire-box over the grate bars, and contain inner tubes of much smaller diameter. The latter are intended to aid the circulation of the water, which passes down the inner tube and up again through the annular space around it, where, being most exposed to the action of the flame, it is hottest. Of the different varieties of tubulous boilers, those which seem most approved may be indicated by noting one of them as type. It consists of horizontal wrought-iron welded tubes placed in vertical rows, each row being connected at each end with a vertical tube, also of wrought-iron and of larger diameter. In order that the horizontal tubes may be properly fixed in the vertical ones, a hole must be provided in the side of the latter, opposite the mouth of each of the former. That these holes may be kept tight at any pressure of steam, the ingenious device is adopted of closing them with taper plugs put in *from the inside*, so that the pressure of steam keeps them shut, and the higher the pressure the less possibility of leakage there is. Locomotive boilers are always multitubular, for the same reasons as marine boilers. The boiler of a single locomotive often contains 1,500–1,800 sq. ft. of heating surface, and occasionally as much as 2,000 sq. ft.

The principal test of the efficiency of a boiler is the quantity of water (generally expressed either in pounds or gallons), which it will evaporate with the consumption of one of coal. Of course this varies very much with the quality of the fuel, but with good pit coal (not dross), a Cornish boiler should evaporate 6 to 8 lbs. of water per lb. coal, and a multitubular boiler, such as fig. 2, about 10 or 11 lb. per lb. coal. The best rate of combustion on the grate varies with the construction of the boiler, from 10 to 18 or 20 lb. per sq. foot of grate surface per hour.

Until very recently, boilers were almost invariably made of wrought-iron plates riveted together. The parts most exposed to the action of the flame were made of the best quality of iron, and the other parts of inferior qualities, according to their position in reference to the flame. Now, however, for all first-class work, and work where high

BOILER.

pressures are to be used, the common material for boiler construction is 'mild' steel made by the open hearth process, and having a tenacity of about 28 tons per sq. in. Copper is often used in the fire-boxes of locomotives, but seldom in any other description of boiler. Brass boiler-tubes are sometimes seen, and on account of its better conducting qualities, brass is to be preferred to iron, but its cost prevents it superseding iron in the great majority of cases, and there are other drawbacks to its use.

Every boiler has, to render it complete and workable, a number of *fittings* or *mountings*, of which the following are the principal: A glass gauge to show the level of the water inside the boiler, and gauge-cocks for the same purpose; a gauge to show the pressure of the steam; a cock for admitting water; a cock at the bottom for emptying or 'blowing off;' a valve for the discharge of the steam; one or two safety-valves, weighted so that, when the pressure of steam in the boiler reaches a certain height, they open and allow the steam to rush into the air; a door by which a man can enter to clean the boiler, etc.

In order to induce a current of air through the furnace so that a proper combustion may be maintained, stationary boilers are usually provided with a chimney of considerable height, and made of brick or sheet-iron, to which the products of combustion are conducted after they have left the boiler. In locomotive boilers, and in some other cases where a sufficiently tall chimney cannot be made use of, a very powerful current is made by the ejection of the waste steam through a blast-pipe with a contracted nozzle at the base of the chimney. To prevent loss of heat by radiation, and the consequent waste of fuel, boilers should always be covered, in all parts exposed to the atmosphere, with felt or some non-conducting composition.

The upright B., a modified form of the locomotive B., much used for portable and stationary engines, has some 30 upright tubes or flues, more or less, directly above the fire. The upright B. occupies small space and is efficient. The upright B. for fire-engines has a large number of tubes, 300 more or less, usually of brass or copper.

Sectional or water-tube boilers, in which the water and steam, instead of the products of combustion, circulate in the tubes, are the most distinctively American. One of the earliest in use, the Harrison B., is made of a large number of hollow cast-iron spheres connected by curved necks and held together by long wrought-iron bolts and caps; it has withstood the most severe tests.—A somewhat different type of B. is constructed with water-tubes traversing the fire-chamber and exposed to the flame and hot gases; the tubes are usually inclined downward from front to rear, producing a continuous circulation of the water by means of the difference of temperature of the front and rear portions; the tubes are connected at each end with a manifold chamber.

In the Babcock and Wilcox B., these chambers are connected with one or more horizontal steam-drums lying lengthwise above them outside the fire-chamber, the water-

BOILER.

level being in the drum and the tubes entirely filled with water. In the Root B. the water-level is below the elevated forward ends of the three upper rows of the inclined tubes, making this portion a surface for the production of superheated steam; only steam enters the drum above. The Whittingham B. has within the water-tubes other smaller tubes or flues through which the heated gases pass after passing around outside the outer tubes, the steam-drum and connections being also inclosed within the fire-box; this gives a large heating surface. In all these boilers there are diaphragms to make the flame and gases pass back and forth several times over different portions of the tubes before reaching the chimney.—Another and recent form of B., for which great strength is claimed, is made with its heating surface a coil of pipe through which the feed-water is forced.

Metal exposed to flame or hot gases, if in contact with water on its other side, produces steam; if in contact with steam, heats the steam still hotter, making superheated steam, which has greater expansive force; in a B. the steam-producing surface is its *water-surface*; the other is its superheating surface.

The *draught-area*, or calorimeter, is the area or a cross-section of the space *around* the tubes in a water-tube B. or *within* the flues in a flue B.; the draught-area should be about one-eighth of the area of the grate. Let the combustion maintain the same degree of completeness, then the heat of the furnace depends on the amount of air furnished; so that the total draught-area should be large. At the same time the area of the water-surface and superheating surface combined must be made large in proportion; otherwise the heated gases rush to the chimney without delivering their heat to the water; accordingly the flue space should be divided into many narrow passages, so that each particle of gas may impinge on the metal and deliver a large portion of its heat. Evidently a smaller draught-area may be better than a larger one not well arranged. An excess of air supply lowers the temperature of the furnace. *Appleton's Cyclopædia of Mechanics* contains tables important on this point to designers of boilers.

Steam coming to the surface of the water and bursting in bubbles is liable to carry water-spray along with it and into the cylinder of the engine, where it cools and accumulates, especially if the exhaust-port is too small or wrongly situated to discharge it; this is *priming*. The *volume of clearance*, the space left at the end of a stroke between the end of the cylinder and the piston, may be less than the amount of water thus getting before the piston near the end of the stroke; if so, it is as mischievous as a mass of metal in the same position between the cylinder-head and the piston. The water is nearly incompressible; something else must give way, and the result is a broken crank-pin, a split cylinder, or the cylinder head burst out. The cause of priming is want of steam-room, too small area at the surface of the water, or the dirty water used. To remove the last cause, collect the water

BOILER.

in tanks and give it time to settle before using. A properly constructed B., checking the escape at the throttle, more expansive working of the engine, may avoid priming in the other cases. Pressure suddenly diminished, as by opening the safety-valve or the throttle, sets free an extra gush of steam, and so tends to cause priming. Some insert a perforated plate for the steam to pass through on its way to the cylinder to free the steam of water. In some locomotives a longitudinal perforated pipe takes the place of the ordinary steam-dome.

Priming may be caused by obstruction of the steam circulation on account of faulty placing of the water-tubes.

Various contrivances are in use as low-water alarms. One kind depends on the action of a float placed within the B. and having connections that cause the steam to sound the whistle when the float sinks too low. Others work by the direct action of the steam entering a tube placed just below the proper water-line. Others are electric. Metal plugs fusible at a low temperature are also used, placed just below the extreme low-water line.

B. explosions occur under various conditions, some not fully understood, with either low or high pressure, and even when the B. is well filled with water.

Extreme weakness in a single small area is less dangerous than more extended and uniform weakness, the break, if any, being confined to the small area. Old boilers having large areas or long lines of weakness are liable to violent explosions at even moderate pressures. Good strong boilers under too high pressure explode the most disastrously.—Parts may be made weak gradually by corrosion, or suddenly by overheating from lack of water, or from non-conducting deposits and incrustations of dirt or of lime sulphates and carbonates and other mineral salts. A sudden flow of water on an overheated surface may produce excess of steam-pressure. Four minutes or less is long enough for the pressure in a locomotive B. to rise from the working to the exploding point.—The *factor of safety*, for a given B., is the number of times the regular working-pressure that it can sustain. This factor should be 6 or 8; it is usually far too low, often less than $1\frac{1}{2}$.—Boilers, after inspection, should be submitted to a hydrostatic test. For this, fill the boiler with water, and raise the pressure to $1\frac{1}{2}$ or more times the regular working-pressure. The United States laws regulating steam-vessels require such a test.

The term *horse-power*, though inappropriate, is in general use with reference to boilers and engines; it may refer to the efficiency of the engine, the size of the B., or the evaporating capacity of the B.—more correctly to the last. The unit, horse-power, was formerly taken as an evaporating power of 1 cubic ft. per hour at 212° F. One-fourth to one-half of a cubic ft. per hour for each horse-power will furnish enough steam for a good modern engine. A good B. will require 6 to 12 sq. ft. of heating surface for each horse-power. For high efficiency the amount of fuel required should be 1 lb. of good anthracite to

BOILING.

about 13 lbs. of water, or $1\frac{1}{4}$ to $2\frac{1}{2}$ lbs., per hou. for each horse-power.—The process of testing the evaporating capacity of a B. requires careful experiment and a complicated calculation from the data obtained. The trial should last some 24 hours.

See BOILING: MANOMETER: SAFETY-VALVE: STEAM: STEAM-ENGINE: STEAM-CRANE.

BOILING, in Cookery. One important preliminary rule in boiling rests on the fact (see BOILING—BOILING POINT) that water cannot be heated in an open vessel, or in one with the ordinary fitting lid of a cooking utensil, to a higher point than 212° . When a vessel, then, has once begun to boil, a stronger fire than is just sufficient to keep it boiling will only evaporate, or waste, the water in steam, but will not cook the food any faster; on the contrary, the outside will be rendered so hard by the quick boiling, that the interior will not be reached by the heat.

By long soaking in cold or tepid water, fresh meat loses much of its albumen and nutritive juice. When a piece of meat is to be boiled, it is necessary, for the preservation of these juices, and its consequent tenderness and nutritious quality, that the outside should be sealed up, by immersing it in boiling water, and keeping up the temperature for a minute; this closes up the pores, and coagulates the albumen of the exterior. The boiling water should then be taken off, and as much cold put in as will reduce it to a tepid state; it should then be gradually warmed until it reaches a degree *slightly* under the boiling-point, called simmering; at this point it must be kept without suffering any interruption of the heat, till the time elapses allowed for cooking the food. 'The cooking goes on through the agency of the natural moisture of the flesh. Converted into vapor by the heat, a kind of steaming takes place within the piece of meat; it is, when skilfully done, cooked by its own steam.'

To prepare meat for B., it should be trimmed, washed, and dried before it is placed in the water. As it simmers, the water should be kept well skimmed with a skimming-spoon, as frequently as any scum is thrown up, but with due remembrance of the fact, that raising the lid of the vessel lowers the temperature of the water; and the preservation of an equal degree of heat throughout the operation is of the greatest importance.

For fresh meat, 20 minutes is the allowance for each pound. The weather must also be considered: in frosty weather, or with very thick joints, extra 20 minutes should be given. Mutton loses in boiling, in 1 lb., $3\frac{1}{2}$ oz.; beef, in 1 lb., 4 oz. Meat that has been salted and dried has its outer coat already sealed up; it requires, therefore, to be thoroughly washed, soaked for two hours in cold water, dried, and put to boil in cold water, gradually brought to the boiling-point, and kept simmering for a time proportioned to the size of the piece. Hams and tongues, to be eaten cold, should be allowed to cool in the water in which they have been boiled. The following is a time-table for the cooking of these meats, reckoning from the time the water boils: A ham of 16 lbs. takes 4 hours; a tongue of

BOILING—BOILING-POINT.

16 lbs., 2 to 4 hours; a pig's face of 16 lbs., 2 hours; a piece of bacon of 4 lbs., 2 hours.

Poultry, and White Meats, as veal or rabbit, should be put at once into tepid water, gradually brought to the boiling-point, drawn back immediately, and simmered, carefully skimming the water as scum rises. A chicken, or small fowl, or rabbit, will take 35 minutes; a fowl, or old rabbit, an hour, or an hour and a half, according to size. Some cooks add milk to the water, but this is apt to cause the scum to stick to the meat in streaks; some use a cloth to inclose the meat, but this frequently imparts to it a disagreeable taste. Having trimmed, washed, and dried the meat, all that is necessary to keep it white is to use a perfectly clean utensil, to be attentive to the skimming, and careful that no soot falls from the lid into the pot when doing this. Meat should be only just covered with water; if the water wastes, a cupful of water at the same temperature should be added. The liquor in which fresh meat has been boiled is an excellent foundation for soups and gravies.

Fish should be well cleaned and scraped: liver and roe should be carefully preserved, and boiled with the fish, in a fine net: they are used to garnish the fish. The sound of cod should be carefully cleaned, and left in the fish. Fish should be placed in cold water, in which a tablespoonful of salt and one of vinegar is mixed; should be gradually brought to the boiling-point, and simmered carefully, lest the outer part should crack before the thick part is done. If on drawing up the fish-plate, a thin knife will easily divide the flesh from the bone in the thick parts, and if the eyes contract, and become like balls, the fish is sufficiently cooked. Drain by laying the plate across the kettle covered with the lid, and dish perfectly dry on the strainer, which should be covered with a napkin.

Vegetables require generally to be well washed, and placed in boiling water, in which is mixed a large spoonful of salt. When they sink, they are done. Green vegetables should be well picked, soaked in salt and water, drained and boiled in plenty of water, in a vessel without a lid. Cabbage requires two waters; spinach, very little, as it is full of moisture. Pease and beans should not soak, but be merely rinsed in a colander. Winter potatoes should soak for an hour or more; whether they should be placed in cold or boiling water, depends on the sort. A piece of soda the size of a small marble assists the B. of pease and cabbage, if the water is very hard.

For boiling meat, the best vessel is of iron, tinned inside or not, but kept perfectly dry, and free from grease or rust. Tinned vessels are proper for boiling fish and vegetables; they require to be kept very dry, the moisture entering between the metals rusts the iron, and makes holes that cannot be mended. A tinned vessel in daily use should be polished once a week with fine whiting and oil; too frequent polishing wears off the tin. The advantage of a tin over an iron utensil is, that it gains heat sooner.

BOILING (of Liquids)—BOILING-POINT: the act of

BOILING—BOILING-POINT.

bubbling by heat—the temperature at which ebullition is maintained. When heat is applied to a vessel containing water, the temperature gradually rises, and vapor comes silently off the surface; but at a certain degree of heat, steam (q.v.) begins to be formed in small explosive bursts at the bottom, and rising through the liquid in considerable bubbles, throws it into commotion. If, after this, the steam is allowed freely to escape, the temperature of the water rises no higher, however great the heat of the fire. The water is then said to *boil*, and the temperature at which it remains permanent is its *boiling-point*. The boiling-point of water is ordinarily 212° ; but every liquid has a point of its own. Thus, sulphuric ether boils at 96° ; alcohol at 176° ; oil of turpentine, at 316° ; sulphuric acid, at 620° ; and mercury at 662° . The boiling-point of liquids is constant, under the same conditions, but is liable to be altered by various circumstances. Water with common salt in it, e.g., requires greater heat to make it boil than pure water. The nature of the vessel, too, exerts an influence; in a glass vessel, the boiling-point of water is a degree or two higher than in one of metal, owing to the greater attraction that there is between water and glass than between water and a metal. But what most affects the boiling-point is variation of pressure. It is only when the barometer stands at 30 inches, showing an atmospheric pressure of 15 lbs. on the sq. inch, that the boiling-point of water is 212° . When the barometer falls, or when part of the pressure is in any other way removed, it boils before coming to 212° , and when the pressure is increased the boiling-point rises.—Thus, in elevated positions, where there is less air above the liquid to press on its surface, the boiling-point is lower than at the level of the sea. An elevation of 510 ft. above the sea-level makes a diminution of a degree; at higher levels, the difference of elevation corresponding to a degree of temperature in the boiling-point increases; but, the rate of variation once ascertained, a method is thus furnished of measuring the heights of mountains. See HEIGHTS, MEASUREMENT OF. At the City of Mexico, 7,000 ft. above the sea, water boils at 200° ; at Quito, 9,000 ft., at 194° ; and on Donkia Mountain, in the Himalaya, at the height of 18,000 ft., Dr. Hooker found it to boil at 180° . Boiling water is thus not always equally hot, and in elevated places many substances cannot be cooked by boiling. Under the receiver of an air-pump, the same effect is still more strikingly seen; water may be made to boil at the temperature of summer, and ether when colder than ice. In complete vacuum, liquids, in general, boil at a temperature 140° lower than in the open air. The knowledge of this effect of diminished pressure is now largely turned to account in sugar-boiling, in distilling vegetable essences, and in other processes where the substances are apt to be injured by a high temperature.—By increasing the pressure, water may be heated to any degree without boiling. Papin's Digester (q.v.) is formed on this principle. Under a pressure of two atmospheres, the boiling-point rises to 234° ; of four atmospheres, it

BOIS BLANC—BOISSERÉE.

is 294°; of ten atmospheres, 359°; of fifty atmospheres, 510°.

In a deep vessel, the water at the bottom has to sustain the pressure not only of the atmosphere. but also of the water above it. At a depth of 34 ft. the pressure of the water above is equal to an atmosphere, or 15 lbs. on the sq. inch; and thus, at the bottom of a vessel of that depth, the water must be heated to 234° before it is at its boiling-point. This principle has been successfully applied to explain the phenomena of the Geysers (q.v.).

If a small quantity of water be poured into a silver basin, heated above the boiling-point, but below redness, it will begin to boil violently, or perhaps burst into steam at once. But if the basin be heated to redness, the water will gather itself into a globule, and roll about on the hot surface, without becoming heated to the boiling-point. For the explanation of this and other interesting phenomena connected with it, see SPHEROIDAL CONDITION OF LIQUIDS.

BOIS BLANC, *boy blānk*: island of the United States; in Lake Huron, between Michillimackinac and Michigan; 10 m. long, 3 m. wide; having a light-house at its e. end.

BOIS D'ARC: see OSAGE ORANGE.

BOIS-DE-BOULOGNE: see BOULOGNE.

BOISÉ CITY, *boy'zéh*, F. *brâ-zâ*: capital of Ada co. and of the state of Idaho; on the Union Pacific railroad, and on the Boisé river; in the Snake river valley, 45 m. s.w. from Idaho City. There are two national banks (cap. \$150,000); a daily, semi-weekly, and weekly newspaper; and a high school. A govt. assay office is here, and a penitentiary. There are rich mines in the mountains near, and a large trade with the surrounding region. Pop. (1900) 5,957.

BOIS-LE-DUC, *bwâ-léh-dük'*, (Dutch, 's *Hertogenbosch*, 'Duke's Forest'): capital of the Netherlands, province of N. Brabant; at the junction of the Dommel and the Aa. The fortifications are greatly strengthened by the natural situation, as the surrounding country can be flooded, leaving only two roads passable. It is a clean, well-built town, about 5 m. in circumference, intersected by canals, and has a citadel called Papenbril. B. was founded 1184 by Godfrey III., Duke of Brabant. His son Henry strengthened the town with walls. B. was ineffectually besieged 1601 and 1603, but surrendered to the Dutch, 1629. In 1794, it was taken by the French; and 1814, retaken by the Prussians. Pop. (1897) 30,355.

BOISSERÉE, *bwâs-râ'*, SULPIZ: 1783-1841; b. Cologne: archeologist. A visit to Paris which he and his brother Melchior (1786-1851), with their friend Joh. Bapt. Bertram, made 1803, inspired the trio with the idea of collecting and preserving the scattered specimens of early German art. The realization of this idea became the object of their lives. After many years of unwearied research, they gathered together 200 pictures, which received the name of 'the Boisserean Collection.' The King of Würtemberg having presented the brothers with a spacious edifice in Stuttgart,

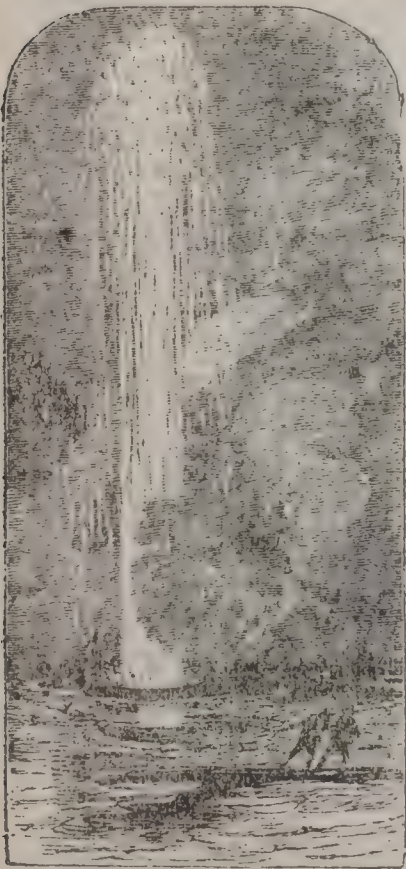
the pictures were transferred thither, and skilfully arranged, according to their age and importance. This brought to light a very important historical fact, previously unknown—viz., that in the 14th c., Germany possessed a school of art based on Byzantine traditions. Great light was also thrown upon many of the Flemish masters, and especially on the influence exerted by Jan Van Eyck. The collection was divided into three sections corresponding to three historical periods—the first comprising the works of the Cologne school in the 14th c.; the second, those of Van Eyck and his disciples in the 15th; and the third, those of the German painters at the close of the 15th and beginning of the 16th c. In 1827, the collection was sold to the King of Bavaria; and in 1836 was transferred to the picture-gallery (*Pinakothek*) in Munich, whither the brothers followed it. Sulpiz left several interesting and valuable works; such as, *Monuments of Architecture on the Lower Rhine, from the 7th to the 13th c.* (Munich, 1830–33); *Concerning the Temple of the Holy Grail*, 1834; *Collection of Old Low and High German Paintings, with Notices of the Early Painters*, by Sulpiz and Melchior B. and Joh. Bapt. Bertram, lithographed by J. V. Striener (1822–39); and a very magnificent work, entitled *Views, Plans, Sections and Details of the Cathedral of Cologne, with Restorations after the Original Plan, accompanied by Researches on the Architecture of Ancient Cathedrals*, etc. (1823–32).

BOISSONADE, *bwá-so-nád'*, JOHN FRANCIS: 1774, Aug. 12—1859; b. Paris, of a noble Gascon family: classical scholar. He was originally intended for the administrative career, but renounced it for philology, in which he had always found his favorite recreation. He soon made himself known to the critical world by his acute and learned contributions to the literary journals, was appointed prof. of Greek in the Acad. of Paris 1809, and entered on the active duties of the chair, 1812. In 1813, he was admitted into the Acad. of Inscriptions; and in 1828, he succeeded Gail as prof. of Greek literature in the College of France. His more important works are: *Philostрати Heroica* (Paris, 1806); *Marini Vita Procli* (Leip. 1814); *Tiberius Rhetor de Figuris* (Lond. 1815); *Sylloge Poetarum Græcorum* (Paris, 1823–26); *Babrii Fabulæ* (Paris, 1844); etc. He contributed in his earlier years numerous papers on philological subjects to Parisian, English, and German journals, and gave to classical study in France a powerful and still perceptible impulse by his eloquent and attractive lectures from his chair. Besides his many and laborious philological works, he won distinction as a French lexicographer and belle-lettrist, and was one of the most copious and valued contributors to the *Biographie Universelle*. He left behind him a reputation for learning almost German in its profundity.

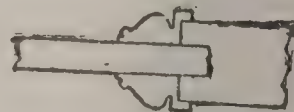
BOISSY D'ANGLAS, *bwá-se' dôn-glá'*, FRANÇOIS ANTOINE, Count: 1756, Dec. 8—1826, Oct. 20; b. St. Jean Chambre, dept. of Ardèche, France. After filling for some time the office of major-domo to the Count of Pro-



Bœhmeria Nivea: *a*, Male flower; *b*, Glomerule of female flowers; *c*, Single female flower; *d*, Pericarp.



Bomb.



Bolection-molding.

Boiling.—The Grand Geyser in the Yellowstone Region, United States.

BOISTEROUS—BOKER.

vence (Louis XVIII.), he was elected a deputy to the states-general. While a member of the constituent national assembly, he was accused of a design to change the French monarchy into a Protestant republic. During the Reign of Terror, fear of 'the Mountain' kept him quiet; but, yielding to the solicitations of Tallien and Barère, he joined the conspiracy against Robespierre. Two months after the execution of the tyrant, he was elected sec. of the convention; and shortly afterward, a member of the committee of public safety. As director of the supply of provisions for Paris, he was exposed to popular hatred and great peril during the riotous and sanguinary proceedings of the 12th Germinal and 1st Prairial in the year 3 of the Republic; but firmness and presence of mind preserved him. He was afterward pres. of the Council of Five Hundred; was called into the senate by Napoleon; and made a peer by Louis XVIII. Through all the changes of the times, he maintained his early principles. His chief writings are, *Recherches sur la Vie, les Ecrits, et les Opinions de Malesherbes*, 1819, and *Études Littéraires et Poétiques d'un Vieillard*, 1825; but, in addition to these, he published numerous essays, pamphlets, and letters.

BOISTEROUS, a. *boys'tér-üs* [Scot. *bustuous*; OE. *bois-tous*, violent, large; *boist*, a threat: W. *bwyst*, wild: Low Ger. *buster*, wild or fearful]: noisy; roaring; stormy; tumultuous; violent. **BOIS'TEROUSLY**, ad. *-lī*. **BOIS'TER-DUSNESS**, n. the state or quality of being boisterous; tumultuousness.—**SYN.** of 'boisterous': turbulent; tumultuous; noisy; impetuous; loud; roaring; violent; stormy; furious.

BOJADOR, *boj-a-dŏr'*, CAPE: headland on the w. coast of Africa, lat. 26° 7' n., long. 14° 29' w., forming the w. extremity of the Jebel Khal (or Black Mountains), a rocky ridge running e. into the Sahara. In consequence of its extreme flatness, and the shoreward tendency of the currents, the coast, extending n. to Cape Nun, is one of the most dangerous that mariners have to encounter, and is frequently the scene of shipping casualties. The Portuguese doubled this cape, 1433, and from them it received its name B. C., signifying 'a round cape.'

BOJANO, *bo-yā'no*: town in the province of Campobasso, Italy, 13 m. s.w. of the town of Campobasso. It has a cathedral and ancient remains. It has suffered greatly from earthquakes, especially in 1805. Many scholars have believed it to occupy the site of the famous Samnite city of *Bovianum*. B. was captured by the Romans B.C. 311, 305, and 298. In the Social war the confederates made it their capital. Cæsar established here a military colony.—Pop. 3,500.

BOJAR: see **BOIAR**.

BOKER, *bŏ'kēr*, **GEORGE HENRY**: poet: 1823, Oct. 6—1890, Jan. 2; b. Philadelphia. He graduated at Princeton 1843; studied law; was admitted to the bar, but never practiced. After several years of European travel, he pub. a volume of poems 1847, and 1848 a tragedy, *Calannos*,

BOKHARA.

which was acted in England at the time, and was resuscitated by Lawrence Barrett in the United States 1883. During the civil war he wrote many patriotic lyrics. B. was U. S. minister to Turkey 1872-76, and to Russia 1876-79. His first vol. of poems was *The Lesson of Life* (1847); among his volumes are: *Poems of the War*; *Street Lyrics*; *The Book of the Dead*. Of dramatic works, besides *Calaynos*, he wrote *Anne Bolleyn*; *Leonore de Guzman*; *Francesca da Rimini*; *The Widow's Marriage*.

BOKHARA *bókh-â'rá* (i.e., Eastland), or USBEKISTAN, *ôz-bêk-is-tân'*: vassal state of Russia in central Asia; lat. 37°-41° n., long. 62°-72° e.; bounded n. by Turkestan, e. by the Pamir, s. by Afghanistan, w. by the Kara Kum desert; about 92,000 sq. m.; reigning sovereign (1893) Sayid Abdul Ahad, who succeeded his father 1885; principal towns, with pop., Bokhara 100,000, Karshi 25,000, Khuzar, Shahr-i-Sabz, Hissar, 10,000, Charjui, Karakul, and Kermine. Since the treaty of (1873) no foreigner can be admitted into B. without a Russian passport.

Only in the neighborhood of the rivers is cultivation possible. The rest of the soil of B. is composed of a stiff arid clay, interspersed with low sand-hills. B. belongs exclusively to the basin of the Sea of Aral. It has only three rivers of any importance—the Amu or Jihun (anciently the *Oxus*), the Zar-afshan, and the Kurshi. Entering B. at Kushtuppa, the Amu flows through the country w.n.w. to the Sea of Aral. Its banks in some parts are very fertile, especially in the neighborhood of Balkh. The Zar-afshan, which rises in the spurs of the Thianshan Mountains, after a course of about 200 m. issues into the plain near Samarcand, and thence fertilizes the district (Meeankal) to the city of Bokhara. Before reaching the city, it sends out a n. branch, which, after a fertilizing course of several miles, is absorbed in the sand. The s. branch passes B. to the n., and terminates in the lake of Kara-kool, a sheet of salt water about 25 m. in circumference, connected with the Amu by irrigating canals. The valley of the Zar-afshan is the richest as well as the most populous in Bokhara. The Kurshi has a course of about 60 m. before it is lost in the desert.

The climate of B. is moderate and healthful. Its geographical position secures B. the transit-trade between Russia and the s. of Asia. The rains usually begin and end with February. Violent sand-storms are frequent, and occasion ophthalmia among the inhabitants, who are also subject to the attacks of the guinea-worm, which penetrates the flesh, causing great pain and annoyance.

Minerals are not numerous in kind. The sands of the Oxus yield gold. Salt deposits are frequent. Alum and sulphur are found in the vicinity of Samarcand, and sal-ammoniac in the mountainous districts. The other products include rice and cotton, wheat, barley, beet-root, vegetables, hemp—used only in the preparation of an intoxicating liquor called *bháng*—silk, fruits in immense abundance, and tobacco. The camel's thorn, a plant that grows luxuriantly in Samarcand and Kurshi, exudes a saccharine gum or manna, extensively used as sugar.

B. imports green tea, mostly from India, indigo, Dacca muslins, drugs, shawls, and kincohs; and exports raw silk and cotton. The religion is Mohammedan. The ameer has an army of 20,000 officers and men, of whom 4,000 are kept in the capital. All have been drilled by Russian officers and a large proportion armed with Russian rifles. The import of spirituous liquors, except for the use of the Russian embassy, is forbidden. A Russian railway extends from Charjui to Samarkand, and a telegraph line from Samarkand to the capital.

B. was conquered by the Arabs in the beginning of the 8th c., who were dispossessed, 1232, by Genghis Khan. It fell into the hands of Timur, 1303, and was taken by the Usbeks, 1505, and it has since remained under the same Turkish race. During the 18th c., the khans were characterized by the worst abominations of eastern vice and fanaticism; and Bokhara lost its pre-eminence among the khanates of Turkesian. The canals, which alone gave fertility to the country, were neglected; and large areas were again overspread by the desert; the population diminished; B. became a centre of corruption and anarchy. About 30 years ago, it was ruled by the Khan Nasrullah, a barbarous and incapable tyrant. It was he who caused, 1843, the murder of Colonel Stoddart and Captain Conolly, who went on a mission to B. Dr. Wolff, who visited the country, 1844, with a view to ascertain their fate, narrowly escaped with his life, after a detention of some months. After the capture of Tashkend by the Russians 1865 (see TURKESTAN), a religious war was preached against the Russians, and the khan, Muzaffer-Eddin, was compelled to oppose them. He was defeated at the battle of Idjar, 1866, May 20; and Samarcand (q.v.), one of the most important cities of B., was taken 1868, May. The command of the upper course of the Zar-afshan, which fertilizes the central part of B., placed the khan entirely under the power of Russia. In 1868, July 30, a peace was concluded, by which Samarcand was ceded to the czar and stipulations were entered into, favorable to Russian trade. The treaty caused great dissatisfaction to the fanatic Mussulmans of B. They rose in rebellion, placing at their head Khan Abdul Malik Mirza, son and heir of the khan. The Russians, on the intercession of the khan, aided him; and in Oct. the rebels were defeated near Karchi. The rebel prince sought refuge in Afghanistan. Shere Ali, the ameer, gave him a warm welcome, and would have invaded Bokhara had he not been restrained by Lord Mayo, the Indian viceroy, who instructed him that England could not encourage him in any attack on his neighbors. While Shere Ali was meditating an invasion of B., Abdurrahman, a nephew of Shere Ali, who had married a daughter of the khan of B., endeavored to obtain Russian aid in invading Afghan Turkestan with a Bokharian army. But, in this case, Russia opposed the enterprise (see AFGHANISTAN). During the invasion of Khiva, 1873, the khan of B. efficiently assisted the Russians, and was rewarded by a large addition to his territory from the Khivan possessions on the right bank of the

Öxus, under the treaty entered into between Russia and Khiva, 1873, July.—See *History of Bokhara from the Earliest Period to the Present Time*, by Vambery. Pop. about 2,500,000.

BOKHA'RA (honored with the title of the 'Treasury of Sciences'): famous city of central Asia, capital of the khanate of B.; on a plain, lat. $39^{\circ} 48'$ n., long. $64^{\circ} 26'$ e., in the midst of trees and gardens. It is between 8 and 9 m. in circumference, surrounded by embattled mud-walls, about 24 ft. high, with 11 gates. The houses, which are small, ill lighted, and, with the exception of those belonging to the wealthy, uncomfortable inside, are built of sun-burnt bricks on a wooden framework; and the roofs of all are flat. The streets are ill-paved and very narrow, the widest barely sufficing for the passage of a loaded camel, while others are not more than 3 or 4 ft. across. The palace of the khan occupies an eminence of between 200 and 300 ft. in height in the centre of the city. It is surrounded by a brick wall of 60 or 70 ft. high. The area includes, besides the palace, the harem, quite embosomed in trees; various public offices, the residences of the vizier and other important state functionaries, the barracks, royal stables, etc., and three mosques. The mosques, fabulously said to be 360 in number, necessarily form one of the greatest features of Bokhara. The most imposing one occupies a square of 300 ft., and has a cupola 100 ft. high, ornamented with blue tiles. Attached to it is a tower of about twice the height, built by Timur, from which criminals are hurled. B. is celebrated as a centre of learning, and has, in addition to a vast number of schools, about 80 colleges, attended, it is stated, by about 5,000 students. As a commercial town, B. is the most important in Central Asia. B. is connected by the Transcaspian railway with Merv, and so with the Caspian ports. Pop., estimated, 100,000. See TURKESTAN.

BOKHARA CLOVER: see MELILOT.

BOKHARA CLOVER: see MELLOIT.

BOLA BOLA, *bo'lá bo'lá*, or BO'NA BO'NA, or BO'RA BO'RA—the liquids *l*, *n*, *r* being interchangeable, or rather, perhaps, undistinguishable in the languages of Polynesia: one of the Society Islands, about 200 m. n.w. of Tahiti; lat. $16^{\circ} 32'$ s., long. $151^{\circ} 53'$ w.; presenting a valuable landmark in a double-peaked mountain of considerable height. It is about 24 m. round, beset by coral-reefs, some of them rising into islets. Pop. abt. 1,800.

BOLAN PASS, *bo-lán'*: a hollow route ascending in a generally w. direction from Sinde, on the Indus, through Beloochistan to Candahar and Ghuzni. Its entrance and its outlet are respectively 800 and 5,793 ft. above the level of the sea. The total ascent, therefore, is about 5,000 ft., which, on a length of barely 55 m., gives an average of fully 90 ft. to the mile. Along the bottom of the pass descends a torrent, which the road generally follows. The route, without being impracticable, is highly defensible in a military point of view. It is bounded throughout by eminences at least 500 ft. in height; and yet, in 1839, a division of the British army, which invaded Afghanistan,

BOLARY—BOLE.

accomplished, with a heavy train of artillery, the whole distance in six days. From the outlet of the B. P. there is no fall toward the w., the spacious plateau of the Dasht-i-Bedowlut retaining the level of the upper extremity.

BOLARY: see under **BOLE** 3.

BOLAS, *bō'las* [Sp. *bola*, a ball]: two leather balls covered and joined by a stout narrow thong, used as a missile by S. American Indians in catching wild cattle. The hunter, holding one ball, whirls the other round his head to give it momentum, then flings it at the animal's legs, with the effect of instantly tying them together, and the animal is helpless.—If made with metal balls, the P. can be thrown far, and has been used in war.

BOLBEC, *bol-běk'*: well-built town of France, dept. of Seine-Inférieure, about 18 m. n.e. of Havre, on the rail way between that place and Paris. B. is on a stream of the same name, which supplies the water-power for several mills, where woolen, linen, cotton, and chemicals are manufactured. Pop. (1881) 10,226; (1891) 12,028.

BOLD, a. *bōld* [Ger. *bold*, quick: Dan. *bold*, intrepid: Icel. *balldr* or *ballr*, courageous, strong]: daring; courageous; fearless; confident; rude; steep, striking to the eye, as figures in a picture, or architectural features. **BOLD'EN**, v. in *OE.*, to make bold; to embolden. **BOLD'LY**, ad. *-li*, in a confident manner; without timidity or fear; with spirit. **BOLD'NESS**, n. the quality of being bold. **TO MAKE BOLD**, to use freedom; to venture.—**SYN.** of 'bold': courageous; daring; fearless; brave; intrepid; undaunted; valiant; gallant; heroic; dauntless; manful; audacious; confident; adventurous; impudent; forward;—of 'boldness': assurance; audacity; hardihood; effrontery; impudence; shamelessness; courage; bravery; intrepidity; dauntlessness; spirit; daringness; freedom; confidence.

BOLE, n. *bōl* [W. *bol*, the belly: Icel. *bolr*, the trunk of a man's body, or of a tree]: the body or trunk of a tree.

BOLE, n. *bōl*, an *OE.* and less common spelling of *boll*: a measure of 4 or 6 bushels: see **BOLL**.

BOLE, n. *bōl* [Gr. *bōlos*, a clod or lump of earth]: in *geol.*, a term applied to friable clayey earths, usually highly colored by peroxide of iron, hydrous silicates of alumina and iron peroxide; when the *boles* become soapy in feel, they are known by the name *mountain soap*. **BOLARY**, a. *bō'ler-ī*, pertaining to bole or clay. Bole occurs in nests and veins in basalt and other trap rocks, in Scotland, Ireland, France, Armenia, Italy, Saxony, and S. America. It feels more or less greasy between the fingers; is of different colors—yellow, red, brown, and black; has a dull resinous lustre, but a shining streak; is readily friable; and often adheres to the tongue when brought in contact therewith. *Armenian B.* has a red tint, is used often for coloring false anchovies, and is employed in coloring tooth-powders. *Lemnian Earth* is the B. from the island of Lemnos, is red in color, and was at one time prescribed by medical men as a tonic and astringent medicine; and acted beneficially, no

doubt, from the large percentage of oxide of iron present. The boles employed in veterinary practice in Europe are generally made from Armenian bole. The savage tribes in S. America eat B. to allay the pangs of hunger; and the inhabitants of Java use cakes made of it, under the name of *Tanaumpo*, when they wish to become slender. When B. is calcined, it becomes hard; and when afterward levigated, a coarse red kind is used as a pigment in Germany under the names of *English red* and *Berlin red*. *French B.* is pale-red; *Bohemian B.*, reddish-yellow; *Silesian B.*, pale-yellow; and *Blois B.* is yellow.

BOLECTION-MOLDINGS, n. *bo-lek' shŭn-möld'ingz*: moldings which project beyond the general surface of the framework of doors, gates, etc.

BOLERO, n. *bō-lār'ō* [Sp.]: Spanish national dance, mostly in the time of a minuet, with a sharp, marked, and peculiar rhythm. It is accompanied with the castanets and the guitar, and frequently with the voice; and the dancer in the movements seeks to represent the different degrees of feeling from coyness to the highest ecstasies of love.

BOLESŁAW, *bo'łēs-lāv*, or **BOLESŁAUS**, *bo'łēs-lá-ús*, I, surnamed **THE BRAVE**, King of Poland: d. 1025; son of Miecislaw, and his successor, 992. He commenced by dispossessing his brothers, who had received part of the duchy, instituted very severe discipline among his troops, and succeeded in making conquests in different directions, notably in Prussia. He was the first ruler of Poland that bore the royal title. He crowned himself, 1001. Pope Sylvester II., who recognized in him an ardent propagator of Christianity, hastened to recognize him as king. His son Miecislaw succeeded to the throne, 1025.

BOLESŁAW, or **BOLESŁAUS**, II., surnamed **THE BOLD**: 1042–1090: King of Poland, son of Casimir I., whom he succeeded, 1058, in spite of the opposition of the greater part of the nobility. The multitude, being seduced by his grace and affability, received him with acclamations, and thereby won for him the crown. He carried his victorious arms successively into Bohemia, Hungary, and Russia, making conquests wherever he went. After a long siege he obtained possession of the wealthy city of Kiev, and delivered himself and his army to the most unbridled debauchery. This resulted in the breaking up of his army by the desertion of his soldiers, who returned to their own country. Infuriated by that desertion, B. recruited some troops in Russia, returned to his own states, and striking indiscriminately friend and foe, inundated Poland with slaughter and blood. When the bishop of Cracow, St. Stanislaus, wished to recall him to moderation, B. was not only deaf to his appeals, but, in a fit of rage, the king ran to the cathedral, and slew the bishop at the altar. For that murder he was anathematized by the pope, and being deserted by his subjects, fled, and after wandering for a long time, went into a monastery in Carinthia. There, disguised and unknown even to the hour of his death, he was employed as cook for the community.

BOLESŁAW III.—BOLETUS.

BOLESŁAW, or **BOLESŁAUS**, III., surnamed **THE WRY-MOUTHED**, Duke of Poland: son of Ladislaus, and his successor, 1102; d. 1139. He was a great warrior, and is said to have gained more than 40 battles.

BOLETUS, n. *bō-lē tūs* [L.]: genus of *Fungi* (q.v.), of the division *Hymenomycetes*, subdivision *Polyporei*. **BOLETIC**, a. *bō-lēt'ik*, of or from.



Boletus edulis.

The older botanists included in *Boletus* the numerous species now forming the genus *Polyporus* (see **AMADOU: DRY ROT: POLYPORUS**) and other genera; but even as now restricted, it is a very extensive genus. Most of the species resemble the common mushroom and other species of *Agaricus* in form; but, instead of gills, the under-side of the cap (*pileus*) is occupied by a layer quite distinct from it in substance, and pierced by pores so as to be composed of a multitude of small tubes united together, on the inside of which

the *spore-cases* or seed-vessels are produced. Some of the species are edible. *B. edulis* is much used in France, also in Germany, Hungary, Russia, etc. It is the *Ceps ordinaire* of the French markets. It grows on the ground in thin woods of oak, chestnut, or beech, sometimes in mountainous districts, in places covered with moss, heath, or grass. In moist warm summers, it sometimes appears in prodigious quantities. It has also been partially cultivated by inclosing a portion of a wood, and watering the ground with water in which the plant has been steeped, thus, in fact, sowing its minute seeds or spores. In Britain, it is comparatively rare. The cap is smooth, 6 or 7 inches across, with a thick margin, varying in color from light-brown to brownish-black; the tubes at first white, then yellow, and finally yellowish-green; the stem thick and solid, beautifully reticulated. The tubes are removed with the skin and stem, and only the flesh of the cap is eaten, which is firm, white, delicate, of agreeable smell, and is prepared like the common mushroom, dried to flavor sauces, ragouts, etc., or eaten raw with salt and pepper. It is wholesome and nutritious, and certainly to be reckoned one of the very best of the edible fungi.—*B. scaber* is another edible British species, but much inferior.—*B. æneus* is the *Ceps noir* of the French markets, and *B. aurantiacus* is the *Gyrole rouge*.

The tubes in this genus are easily separable from the *pileus*, and this distinguishes the species from those of allied genera. *B. edulis* is found in this country, but appears to be rare. A specimen measured 6 in. high, *pileus* 5 in. broad, stalk 1 in. thick: top grayish red, tubes yellow becoming greenish; stalk dull ochreous, finely reticulated; flesh whitish. In the N. Y. state cabinet report for 1869, Chas. H. Peck describes 19 species, of which 6 are known to be edible.

BOLEYN.

BOLEYN, *bál'en*, ANNE, Queen, wife of Henry VIII., King of England: abt. 1507–1536, May 19; daughter of Sir Thomas B., afterward Viscount Rochford and Earl of Wiltshire; her mother was daughter of the Duke of Norfolk. In her seventh or eighth year, Anne went to France with Mary, sister of Henry VIII., and remained in France after Mary—who had married Louis XII.—returned to England as a widow, under the protection of Queen Claude, wife of Francis I., who was much pleased with her beauty and liveliness. It is not known exactly when she returned to England, but it is certain that she was one of Queen Catharine's maids of honor in 1527, in which year the king appears to have conceived and expressed a passion for her, to which she apparently refused to listen on other condition than that she should become his wife. Henry's religious scruples regarding the lawfulness of his marriage with Catharine, whether he had entertained them before (as is alleged) or not, certainly became much more impatient than they had hitherto been—much too urgent, indeed, for the slow decision of the court of Rome. He, accordingly, without waiting for the award of his holiness, entered privately into matrimonial relationship with Anne B., 1533, Jan., or, as some authorities have it, in Nov. previous. In 1533, Sep., the Princess—afterward Queen—Elizabeth was born. The new queen, naturally light and gay of heart, and educated at the French court, where these qualities were likely to be developed to the utmost, conducted herself toward the courtiers with an easy familiarity not customary in England for one in her position. Concerning the first two years of her married life, we have little information, only it is known that she was favorable to the Reformation, and promoted a translation of the Bible. In 1535, the affections of the king appear to have become alienated from her. According to some historians, the amorous monarch had already fixed upon a successor to Anne; others make out that his passion had nothing to do with her death, and assert that Henry contracted his unseemly hasty marriage with Jane Seymour solely at the request of the peers and privy council. If this latter statement could be thoroughly relied on, it would no doubt tell strongly against Anne, as there would then be no apparent motive for Henry seeking her condemnation if she were innocent. Between conflicting historians, one may well hesitate to decide on this point. In 1536, Feb., the queen gave birth to a son, still-born. The king now became more and more estranged from her; and her freedom of manners had given but too good grounds for her enemies to speak evil of her. On May 1, the annual tournament was held at Greenwich, in presence of the king and queen. The tilting had commenced, the challengers being Viscount Rochford, brother to the queen, and Sir Henry Norris, one of the gentlemen of the king's privy chamber. Suddenly the king rose—his outward bearing manifesting inward disturbance—left the tourney, and with a small party rode up to London, leaving the queen at Greenwich. The popular account is,

that the king's sudden departure was occasioned by the discovery of a handkerchief belonging to the queen in the possession of Norris; but the necessity for any such romantic and sudden cause of jealousy is obviated by the fact, that, in the previous week, a commission, composed of members of the privy council, had been secretly engaged in examining into charges of adultery against Anne; and two of her alleged accomplices in the crime, Sir William Brereton, a gentleman of the king's household, and Mark Smeton, a musician at court, had been already arrested. The queen remained at Greenwich that night. On the following morning, she was examined before the privy council, under the presidency of the Duke of Norfolk, her uncle, but a bigoted Rom. Catholic, and protested her innocence. In the afternoon, however, she was sent up the river to the Tower. Sir Henry Norris and Sir Francis Weston, another courtier, with Smeton, also were examined, and all at first declared their innocence of the charge imputed to them; though afterward the musician confessed to the crime. Norris, too, it is said, made a like confession; but he indignantly repudiated it the next day, on the ground that he had been entrapped into it unwittingly. In the Tower, the queen's every action and word were watched and reported on; but anything she said while a prisoner seems quite as compatible with innocence as guilt, though her words unquestionably prove her to have indulged in a dangerous levity toward the courtiers; for which, however, her French education may be held to account. Her letter to Henry, written May 6, speaks decidedly in her favor. On the 10th May, the grand jury of Middlesex found a 'true bill' on the indictment, which charged the queen with committing adultery with no less than five persons, including her own brother, Lord Rochford, and of conspiring with them, jointly and severally, against the life of the king,, the adultery being alleged to extend over a period of nearly three years. On the 11th, the grand jury of Kent found a true bill likewise. On the 12th, the four commoners, Brereton, Weston, Norris, and Smeton, were found guilty, the last confessing to the charge of adultery only, the other three pleading not guilty to both charges. On the 15th, the queen and her brother were tried before 27 peers, the president being the Duke of Norfolk. They affirmed their innocence; but they were found guilty, and condemned, the queen to be burned or beheaded on the Tower green. On the 17th, Smeton was hanged, and the other four beheaded; general protestations of unworthiness by them at the hour of death being regarded by some historians as evidence of particular guilt. On the 19th, the queen was beheaded—having previously confessed to Cranmer some engagement that rendered her marriage with the king illegal—with her last words praying a blessing on Henry, who, she said, had ever been to her a good and gentle lord, but making no confession of guilt.

It is difficult, if not impossible, to form anything like a just and satisfactory estimate of the character of Anne B.;

historians, for the most part, having made her but a lay-figure upon which to hang the drapery of religious partisanship, or to display the colors of individual sympathy. That, with the courtiers, she maintained not that dignity which becomes a queen, but was unguarded in manner, and thoughtlessly free of speech, there can be no question; there is much room to doubt that she was guilty of the heinous offenses laid to her charge. A woman who resisted for years the criminal solicitations of the king was not likely to seduce systematically grooms of the chamber; nor is it at all probable that one so diabolically bad as she must have been, if the charges alleged against her were true, could be so utterly devoid of that cunning necessary to the practice of successful wickedness. Again, it seems scarcely possible that such an extensive system of conspiracy and crime could have been carried on for nearly three years without being noticed by the lynx eyes, and blown upon by the calumnious tongues, of her numerous and powerful enemies, especially if there were truth in the statement in the indictment, that her accomplices were 'very jealous of each other.' On the other hand, it appears monstrous to suppose that 70 noblemen and commoners of England, before whom the case in its various stages came, against most of whom even slander had not a word to say, should have deliberately condemned a queen and five of her associates, and their own, without conclusive evidence. In the absence of the evidence which they had before them, however, it appears that the proper verdict for history to pronounce is the intermediate one, *not proven*.

BOLI, or Boly, *bo'lē*: town of Asia Minor, pashalic of Anatolia, on the left bank of the river B., and on or near the site of the Roman Hadrianopolis, 136 m. e. from Constantinople. The town occupies an eminence at the extremity of a fertile plain. It has several mosques. There are mineral springs near, and baths much frequented by the Turks. B. is on the caravan route from Constantinople to Erzeroum. Pop. 5,000.

BOLINGBROKE, *bōl'ing-brūk*, HENRY ST. JOHN, Viscount: 1678, Oct. 1—1751; b. Battersea: educated at Eton and Oxford, after which he travelled about two years on the continent, and in 1700, shortly after his return, married the daughter of Sir Henry Winchcomb, from whom, however, he soon separated. Up to this period, he was chiefly notable for his extreme dissipation; but having entered parliament, 1701, he devoted himself to politics, and joining the tory party, soon made himself prominent as an orator. In 1704, he was made sec. of war. This office he retained till 1708, when the whigs came into power, after which he retired from politics, and applied himself to study, but still retained great influence as the queen's favorite counselor. On the fall of the whig party, 1710, he was made sec. of state for foreign affairs. In 1712, he was called to the house of lords by the title of Viscount Bolingbroke, and in 1713, against the wish of

BOLIS—BOLIVAR.

nearly the entire nation, concluded the peace of Utrecht. Having previously quarrelled with his old friend Harley—now Earl of Oxford, his most powerful rival—he contrived his dismissal, 1714, July, and immediately proceeded to form a strong Jacobite ministry, in accordance with the well-known predilections of his royal mistress, whose death, however, a few days after, disconcerted his dangerous and unprincipled schemes. The accession of George I. was a death-blow to his political prospects. Aug. 28, he was deposed from office; in 1715, March, he fled to France; and in Aug. was attainted. For some time he held the office of sec. of state to the Pretender; but his restless and ambitious spirit yearned for the ‘large excitement’ of English politics. His efforts to obtain a pardon were not successful, and he retired to a small estate which he had purchased near Orleans. In 1718, his first wife died, and, 1720, he married the rich widow of the Marquis de Vilette. A judicious use of this lady’s wealth enabled him to return to England, 1724, Sep. His property was restored to him, but he was never permitted to take his seat in parliament. He therefore betook himself to his villa at Dawley, near Uxbridge, where he occasionally enjoyed the society of Swift, Pope, and others of his old friends with whom he had corresponded in his exile, and where he diversified his moral and metaphysical studies by his attacks on the ministry in his periodical the *Craftsman*, in which the letters forming his *Dissertation on Parties* first appeared. In 1735, finding his political hopes clouded forever, he went back to France, in deep chagrin, and continued there till 1742. During this second residence abroad, he wrote his *Letters on the Study of History*, in which he violently attacked the Christian religion. He died after a long illness. His talents were brilliant and versatile; his style of writing was polished and eloquent; but his fatal lack of sincerity and honest purpose, and the low and unscrupulous ambition which made him scramble for power with a selfish indifference to national security, hindered him from looking wisely and deeply into any question. His philosophical theories are not profound, nor his conclusions solid, while his criticism of passing history is worthless. He was one of those clever, unscrupulous men who forget that God has something to do, as well as themselves, with the government of this world. B.’s collected writings were published by Mallet (5 vols., Lond. 1753–4.)

BOLIS, n. *bō'lis* [Gr. *bōlis*, a missile, a meteor; *bolidos*, of a missile: L. *bōlis*, *bolidis*—from Gr. *ballo*, I throw]: a fire-ball passing through the air followed by a train of light; also **BOLLIDE**, n. *bōl'id*, a fire-ball; an aërolite.

BOLIVAR, n. *bō-lē'vār*: one of the nine states which compose the federal republic styled the United States of Colombia. It borders on the Caribbean Sea, and lies between the states of Panama and Magdalena. Area, 21,345 sq. m.; capital, Cartagena; principal commercial centre, Barranquilla. Pop. estimated 300,000.

BOLIVAR.

BOLIVAR: city: see **ANGOSTURA**.

BOLIVAR, *bōl'ī-var*, Sp. *bo-lē'vār*, **SIMON** (named *El Libertador*, for having rescued S. America from the Spanish yoke): 1783, July 25—1830, Dec.; b. Caracas; descended from a noble and wealthy family. Having studied law at Madrid, he travelled extensively on the continent, married, and returned to his native country, where his wife soon died. He again visited Europe, and in 1809 the United States, from which he returned with the determination to free his country from foreign despotism. Arriving at Venezuela, he at once associated himself with the patriots there; and after the insurrection of Caracas, 1810, Apr. 19, he was sent to London with a view to interest the British cabinet in their aims. The British government, however, declaring its neutrality, B. speedily returned, and fought under General Miranda in several successful engagements. The Spaniards having again obtained possession of Venezuela, B. fled to Curaçoa. He did not, however, remain long inactive. Sympathized with by the republican president of New Granada, he raised a force of volunteers; defeated the Spaniards several times, his army increasing with each victory; and, 1813, Aug. 4, entered Caracas as a conqueror, was hailed as the liberator of Venezuela, and made absolute dictator in all civil and military affairs. After defeating the Spaniards in several engagements, he was himself worsted at the battle of La Puerta, and again in Aug. at San Mateo, where he had a narrow escape. He now went to Cartagena, and afterward to Kingston, in Jamaica, where an assassin, hired by the Spaniards, tracked his steps, but, by mistake, murdered his secretary. Having visited Hayti, and assembled there the insurgent refugees, he landed with them on the island of Margarita, 1816, Dec., where he convoked a congress, instituted a government, proclaimed the abolition of slavery, and immediately manumitted his own slaves. The following two years were marked by successes over Morillo. In 1819, Feb., a congress was opened at Angostura, and B., chosen president, was armed with the power of dictator. Having conducted his forces over the almost impassable Cordilleras to New Granada, he achieved the victories of Tunja and Bojaca, and soon afterward declared New Granada united with Venezuela as a republic, under the name of Colombia. The office of president was conferred upon him. 1822 saw the new republic completely cleared of royalist troops, and B. was summoned the same year to help the Peruvians, and was named dictator of Peru. After two years' fighting, the Spaniards were driven from Peru also.

B. now made a tour through the southern provinces of Peru, where he was hailed with every demonstration of rejoicing. The name of the country was changed in his honor to Bolivia (q.v.), and a million of dollars was given him, which he devoted to the liberation of 1,000 slaves. The Bolivian code was adopted by Bolivia, 1826, Dec., and in the following year by the congress of Lima, where B. was made pres. for life. In the mean time, dissatisfaction prevailed in Colombia, to which he returned, and, notwith-

BOLIVIA.

standing some dissent, was confirmed in the presidency, 1826, and again, 1828. About this time a conspiracy threatened his life, but was suppressed by the execution of the leaders and the banishment of 70 accomplices. Meanwhile, his famous code was renounced in Peru, and B. was ejected from the presidency. In 1829, Venezuela separated itself from the republic of Colombia, which was generally disturbed by faction, and B.'s ambition was loudly denounced. B. accordingly laid down his authority, 1830, Jan., notwithstanding earnest entreaties to retain it, and retired, in failing health, to Cartagena. The congress of Bogota voted him a pension of 30,000 piastres, and awarded him the thanks of the Colombian people. He died at San Pedro in Dec., having, shortly before his death, written a farewell address to the people of Colombia, in which he vindicated his character from the aspersions that had been cast on it, and complained bitterly of ingratitude. The war of liberation, and the peculiar elements with which he had to deal, compelled him to assume dictatorial power; but there is no proof that he was ever insincere in his devotion to liberty. His property was mainly devoted to the service of his country. He has been described as the Washington of S. America. Like other great men, he was more correctly estimated after his death. By a resolution of congress, New Granada, 1842, his ashes were removed with great pomp from Santa Marta to Caracas.

BOLIVIA, *bo-liv'i a*: republic of S. America, formerly called Upper Peru, and a part of the viceroyalty of Buenos Ayres; named after Simon Bolivar (q.v.); lat. 8° – 23° s., long. 57° $30'$ – 73° w.; bounded n. and e. by Brazil, s. by Argentina and Chile, and w. by Peru and Chile. The area and pop. by the census of 1900, Sept. 1 were as follows:

TERRITORIES AND DEPARTMENTS.	Area, English sq. m.	Pop.	TERRITORIES AND DEPARTMENTS.	Area, English sq. m.	Pop.
National Ter..	268,861	31,883	Chuquisaca...	36,943	196,474
La Paz.	75,742	423,800	Tarija	53,047	77,887
El Beni.	142,735	25,119	Litoral.....	35,783	49,820
Oruro	26,748	86,081	Gran Chaco...	45,838	100,000
Cochabamba ..	32,622	326,163			
Santa Cruz....	197,688	209,855	Total	983,982	1,852,657
Potosi	67,975	325,615			

The aboriginal element of the pop. is much the most important.

Hydrographically, the country is unique. What, till 1883, was its maritime territory (the depts. of Atacama and Mejillones, now Chilean) is mainly the desert of Atacama, a sandy waste. Again, the plateau, chiefly Bolivian, of Titicaca, shut out from either ocean, loses its drainage in the Lake of Paria. Lastly, the region e. of the Andes is a cradle at once of the Plata and the Amazon, gathering for the former the Pilcomayo and the Paraguay, and for the latter the Beni, the Mamore, and the Guapai. In each section of B. the hydrography may be said to be a clue to the rainfall. On the almost riverless shore of the Pacific,

BOLIVIA.

the air is nearly as dry as the earth; e. of the mountains, the trade-wind vapors from the Atlantic are copious enough to feed, and to flood, the parent streams of the mightiest rivers on the globe; and within the valley of Titicaca (minimum height 12,441 ft.) the clouds barely supply the comparatively scanty evaporation. In temperature, B., almost entirely tropical, may claim to embrace all the zones in the world. Each section, except the sandy wastes on the Pacific, has its peculiar vegetation. The Andes yield a coarse grass for the guanaca, llama, alpaca, and vicuña. The table-land of Titicaca is fertile, but is remarkable for its mineral productions. The silver mines of Potosi, after yielding 2,000 millions of dollars, are believed to be inexhaustible (total silver product of B. 1890 \$11,168,572); while gold, lead, tin, salt, sulphur, nitre, and copper are abundant. B. abounds in the finest supply of india-rubber. Other products are cocoa, cinchona, and coffee.

The constitution of B., as founded by Bolivar, has been subjected to many modifications. In its present form, promulgated 1880, Oct. 28, it vests the executive authority in a pres., elected for 4 years by a direct popular vote. The pres. is aided by two vice-presidents and a ministry controlling five depts.: foreign relations and worship, finance and industry, govt. and colonization, justice and public instruction, and war. The legislative authority is in a congress of two houses, senate of 16 members (1893), and chamber of 64 deputies. The judicial power is vested in a supreme court, 7 dist. courts, and numerous courts of local justices. The elective franchise is extended to all persons who can read and write. The seat of govt. is changed frequently: 1889 it was at Chuquisaca or Sucre; 1902-3 at La Paz; 1892 at Oruro; 1893 at Chuquisaca.

The state religion is the Rom. Cath.; but all other forms are permitted. Education is free in primary depts., and nominally compulsory. In 1890 there were 493 primary schools with 649 teachers and 24,244 pupils; 16 secondary schools and colleges with 91 instructors and 2,126 pupils; 5 universities with 83 professors and 1,384 students in law, theology, and medicine; and a milit. school with 9 professors and 30 pupils. As B. has no sea-coast, its foreign trade is carried on through Chile, Peru, and Brazil. The average value of imports is \$5,830,000; exports, two-thirds of which are silver, \$8,750,000; estimated revenue (1892-3) \$3,958,668, expenditure, \$4,096,668; internal debt (1891) \$4,450,000, foreign \$622,121, total \$5,072,121.

B. 1018-1524 formed a part of the Inca empire of Cuzco; 1780 the Spanish dominion was established; 1825, a congress declared the country an independent republic; 1835, B. invaded Peru and annexed a part of its territory; 1839, B. was defeated by Chile; 1866, it joined the alliance of Peru, Chile, and Ecuador against Spain; and 1879-83 was engaged as an ally of Peru in a war against Chile, in which it lost its seaboard territory.

BOLKHOV—BOLLARDS.

BOLKHOV, *bōl-kōv'*: ancient town of Russia, gov't. of Orel. B. is built chiefly of wood, and has more than 20 churches. It manufactures gloves, hosiery, leather; and trades in tallow, hemp, hides, and oil. Pop. (1892) 28,000.

BOLL, n. *bōl* [Dut. *bolle*, a head: W. *bul*, the husk that incloses the seed of flax: Dan. *bulne*, to swell—see **BOLE** 1 and **BOLLED**]: in *Scot.*, an old measure of capacity of four imperial bushels, or half a sack; in country transactions the *boll* is reckoned at 140 lbs., but the *boll* differs in some places; a *boll* of oats is equal to 6 bushels. In *bot.*, the pod or capsule of a plant: V. to form into a pericarp or seed-vessel. **BOL'LING**, imp. **BOLLED**, pp. *bōld*, had seed-vessels or pods formed.

BOL'LANDISTS: an association or succession of Jesuits by whom the *Acta Sanctorum* (q.v.), or Lives of the Saints of the Christian Church, were collected and published (1643–1794). They received their name from **JOHN BOLLAND** (1596–1665; b. in the Netherlands), who, with the help of Gottfried Henschen, edited the first 5 vols., containing the month of January, in 2 vols., pub. 1643, and the month of February, in 3 vols., 1658. The project had been undertaken by a Flemish Jesuit, Heribert of Rosweyd, and on his death in 1629, his collections were intrusted to Bolland, who established himself in Antwerp, opened a correspondence all over Europe, and associated young men of his order with himself in the work. Several distinguished names are ranked among the B., as Gottfried Henschen (d. 1681), Daniel Papebroek (1714), Conrad Janning (1723), Peter Bosch (1736), Suyskens (1771), Hubens (1782), Dom Anselmo Berthod (1788), and Jos. Ghesquière (1802). The abolition of the order of Jesuits in 1773 caused the removal of the Bollandist Soc. to the monastery of Coudenberg, in Brussels, till the persecutions under Joseph II. brought about its dissolution. In 1789, the abbey of Tongerlo, in Brabant, took up the colossal task of carrying on the *Acta Sanctorum*; but scarcely had the 53d vol. appeared, 1794, May, when the French occupation put an end to the work. It was not till 1837 that a new Bollandist association of Jesuits was formed, under the patronage of the Belgian government, which set aside a yearly sum of 6,000 francs for this object. In 1845, this new society published, in two parts, the 54th vol. of the work, containing, among others, the life of St. Theresa, extending to 671 folio pages. More than 60 vols. had appeared 1887, carrying the work into Nov.; so that at least the next generation may see the completion of the vast series, of which Gibbon has truly said, that 'through the medium of fable and superstition it communicates much historical and philosophical instruction.' Guizot, having ascertained that the 3 vols. for April contain 1,472 lives, estimates that the 53 vols., published before the French revolution suspended the progress of the undertaking, contain more than 25,000 lives of saints.

BOLLARDS, n. plu. *bōl'lārdz* [Icel. *bolr*, the trunk of a

BOLLED—BOLOGNA.

tree]: large posts set in the ground, at each side of the docks, to lash and secure hawsers for docking ships.

BOLLED, a. *bōld* [Dan. *bulne*, to swell; *bul'en*, swollen: Icel. *bolgja*, to swell]: swollen; puffed up: see BOLL.

BOLLINGS, n. plu. *bōl'lingz* [see BOLL 1]: pollard-trees topped and stripped.

BOLOGNA, *bo-lōn'yā*: province of the kingdom of Italy, formerly one of the delegations of the Papal States. It is bounded n. and e. by the provinces of Ferrara and Ravenna, and w. and s. by those of Modena and Florence; area 1,374 sq. m. Sloping gradually up from the plains of Lombardy in the n., its surface becomes mountainous in the s., which is traversed by offsets from the Apennines. B. is well watered, and the streams are extensively used in the irrigation of rice-fields. It is very productive, yielding corn, wine of middling quality, olive-oil, fruit, vegetables of all kinds, hemp, flax, and saffron. Silk-worms are reared in great numbers. Marble, chalk, and gypsum are the mineral products; hemp, rice, and silk the principal articles of trade. Pop. (1901) 527,367.

BOLOGN'A: one of the most ancient cities of Italy, beautifully situated on a fertile plain at the foot of the lower slopes of the Apennine Mountains, lat. 44° 30' n., long. 11° 21' e. It is inclosed by a high brick wall, some 5 or 6 m. in extent, but without fortifications; the canal of Reno intersects it, and, on either side, the rivers Reno and Savena sweep past its walls. B. was, next to Rome, the most important city of the Papal States. The streets in the newer parts of the city are spacious and well paved, with rich and varied colonnades, affording shelter alike from sun and rain; in the older portion, the streets are narrow, crooked, and dirty, and the arcades correspondingly low and gloomy. The city is adorned with many fine palaces of the nobility, rich in fresco-paintings by the great masters. Pre-eminently worthy of notice is the Piazza Maggiore, 'the Forum of B. in the middle ages,' which includes, among other fine buildings, the Palazzo Maggiore del Pubblico, and the Palazzo del Podestà. Among the fine frescoed rooms and galleries of the former, that of the Sala Farnese is the most imposing; the latter is interesting as having been the prison and death-scene, 1272, of Enzius, the son of the Emperor Frederick II., and also as containing the archives of the city. The great feature of B., however, is its religious edifices, remarkable both for the beauty of their architecture, and for the abundance and splendor of their art-treasures. It has more than 70 churches, the most remarkable of which are San Stefano, rich in relics, ancient tombs, and Madonnas, Lombard architecture, and Greek frescoes of the 11th and 12th c.; San Petronio—which, though unfinished, is the largest church in B.—a noble specimen of Italian Gothic, with a meridian traced on the floor by the astronomer Cassini, and numerous splendid bas-reliefs by Jacopo della Quercia and Tribolo, as well as masterpieces by other artists both in sculpture and in painting; San Domenico, with

BOLOGNA.

works by Michael Angelo and Niccolò di Pisa, and many other eminent sculptors—and paintings and frescoes by Guido, Francia, Lodovico Caracci, Marchesi, Simone da Bologna, Colonna, and others; and the cathedral dedicated to St. Peter, also rich in works of art, and interesting historical associations, which, indeed, cluster around all the structures mentioned. In the centre of the city are two remarkable leaning towers, constructed about the beginning of the 12th c.; the taller, the Asinella, has a height of 256 ft., with, in 1706, an inclination of 3 ft. 2 inches. In 1813, a careful measurement showed that this inclination had slightly increased. The other tower, the Garisenda—alluded to in the 31st canto of Dante's *Inferno*—has an elevation of 130 ft., with a lean of 8 feet. The Univ. of B. is said to date its origin from the 5th c., when it was founded by Theodosius II., and to have been afterward restored by Charlemagne. It was not, however, until the 12th c., when it was founded anew by Irnerius or Wernerus, that it attained celebrity. Its reputation during that century was so great, chiefly on account of its school of jurisprudence, that students from all parts of Europe were attracted to it. In 1262, the number receiving instruction is stated to have been 10,000, and it was found necessary to appoint professors specially for the students from each country. The univ. is also celebrated as the first school for the practice of dissection of the human body, as well as for the fact that for centuries learned female professors have prelected within its walls. The famous linguist, Cardinal Mezzofanti, was a prof. here. Though the number of students is now comparatively small, the Univ. of B. still holds a first place among Italian educational institutions. Medicine is now the principal study. The univ. library contains 200,000 vols., and 6,000 MSS., 20,000 vols. having been presented by Benedict XIV. Many of the books are very rare and valuable. In the church of San Domenico there is a public library of 90,000 vols., accessible on holidays, when all others are closed. The Accademia delle Belle Arte is particularly rich in the works of those native artists who founded the far-famed Bolognese school of painting, and it has also some fine specimens of other schools. Besides being the birthplace of those painters that have made its name illustrious, B. gave to the pontifical chair Honorius II., Lucius II., Gregory XIII., Innocent IX., Gregory XV., and Benedict XIV.

B. has some important manufactures, including silk goods, velvet, crape, wax candles, musical instruments, chemical products, paper, and sausages almost as celebrated as its paintings.

B. owes its origin, which is said to be much earlier than that of Rome, to the Etruscans, by whom it was called *Felsina*. It afterward fell into the hands of the Boii, from whom it passed to the Romans, who made it a colony, under the name of *Bononia* (B.C. 189). In A.D. 53, it was nearly destroyed by fire, but was restored by Claudius. After the fall of the Roman empire, it passed into the

BOLOGNA—BOLOGNA PHIAL.

hands of the Longobards, from whom it was taken by the Franks. Charlemagne made it a free city, and its independence was confirmed by a charter from Henry V., in 1112, which also invested the citizens with the choice of their own judges, consuls, and magistrates. The feuds of the Guelph and Ghibelline factions led to the downfall of the republic, and the supremacy of the papal see, B. being made a delegation in 1513. In 1796, B. was taken by the French, and was constituted the chief town of the Cispadane republic; and afterward, when the kingdom of Italy was established, cap. of the department Del Reno. It reverted to the pope, 1815. After that time, B. made several efforts to throw off the authority of the pope. One, in 1831, was successful, but the papal authority was restored in the following year. In 1848, the Austrians attempted to obtain possession of B., but were repulsed. In the following year, however, they succeeded in capturing the city after a siege of ten days. B. was then, like the rest of the Romagna, declared to be in a state of siege, and was made the head-quarters of the Austrian second Italian corps. From the commencement of the Italian campaign of 1859, the Bolognese gave an active sympathy to the national cause; and long before the peace-negotiations at Zurich had been brought to a close, they had intimated their intention of placing themselves under the rule of Victor Emmanuel, as a part of the new kingdom of Italy. Notwithstanding the menaces of the Vatican, they persisted in their resolve; and when the question of 'Annexation to Piedmont, or separate government,' was submitted to the universal vote of the people, 1860, March, the votes for annexation were 1,000 to 1. Pop. (1901) 152,009.

BOLOGNA, *bo-lōn'yá*, GIOVANNI DA: 1524-1608; b. Douai: Flemish sculptor and architect. Impelled by an irresistible inclination to the study of art, he first took some lessons from one of his countrymen, then went to Rome to copy the masters. Michael Angelo had then reached the zenith of his fame, and from him B. received some counsel, and perhaps lessons. After a stay of two years B. started to go home, but stopped at Florence, where he established himself permanently, and rose to such eminence that his only superior was Michael Angelo. His masterpieces are almost innumerable. In his youth he executed a *Neptune* and four *Sirens* to adorn the public fountain of Bologna. In exchange for these marvels of his chisel he demanded a spouse, and a name—*Giovanni Bologna* (instead of John of Douai)—which he rendered illustrious.

BOLOGN'A PHI'AL, or PHILOSOPHICAL PHIAL: a short, thick, narrow glass vessel, close at one end, and open at the other, which the glass-blower prepares from each pot of metal before employing it in the fashioning of tumblers, glasses, bottles, etc. See GLASS. It serves the purpose of enabling the glass-manufacturer to judge of the color and other conditions of the fused glass or metal; and as the jar is not subjected to annealing, it is very friable, and a

BOLOGNA-SAUSAGE—BOLSENA.

small angular fragment of any mineral allowed to drop into it at once causes it to fly in pieces. It is remarkable, however, that a B. P. will bear a very heavy blow on the outside without being fractured.

BOLOGNA-SAUSAGE, n. *bo-lōn'ya-saw'saj* [It. *salsiccia di Bologna*]: a large sausage made of bacon, veal, and pork suet, chopped fine and inclosed in a skin.

BOLOGN'A STONE: old popular name of a radiated variety of heavy spar or sulphate of barium (see **BARYTA**), found near Bologna, which is phosphorescent in the dark. It has been called also Bologna Phosphorus; but this name more strictly belongs to it when calcined, pulverized, and made into little cakes with gum-water. These, after being exposed to a vivid sunlight, are very phosphorescent, either in the air or under water.

BOLOGNESE SCHOOL OF PAINTING, *bo-lōn-yīz'*: founded after the other Italian schools of painting, thence altogether eclectic. It was sometimes called also the Eclectic or Lombard school. Its aim was to unite the best qualities of each of the great masters, combined with the study of nature. It was founded by the Caracci (q.v.) in the beginning of the 17th c. Among the forerunners of the Caracci was Franco, the Giotto of his school, and founder of the Bolognese style of the 14th c. Many of the fading works of himself and his disciples may be seen in the Church di Mezzaratta, a gallery, so to say, of ancient paintings, which is to the Bolognese what the Campo Santo at Pisa is to the Florentine school. Lippo Dalmasio was, at the dawn of the 16th c., the most prominent name. Guido particularly lauded the purity and grandeur of his expression, and the holy feeling infused into his subjects. Francesco Francia, Nicolo dell' Abbate, and Pellegrino Tibaldi are other famous names. The Caracci combined to introduce a new style, and claimed that nature should be taken as a type and pattern, as far as practicable. Among their numerous disciples were Domenico Zampieri (called Domenichino), Guido Reni, Lanfranc, Lionella Spada, Cavedone, Tiarini, Guercino, and Carlo Cignani. Their style was for a time prevalent, but during the present century, it has lost part of its ancient fame.

BOLOR-TAGH, *bō-lōr'tāg'*: supposed lofty mountain-chain of central Asia, extending from lat. 35° to 45° n., and from long. 70° to 75° e., which was said to divide Turkestan (q.v.) into an e. and w. portion. It was described as being connected with the Thian-shan range and others farther n., as well as with the Hindu Kush on the s. Recent explorations have shown, however, that no such range exists, and that all that corresponds to it is a lofty mountainous region which sinks abruptly down on the e. side, to the relative depression known as the Western Gobi or the Tarim Basin. See **PAMIR**.

BOLSENA, *bōl-sā'nā*: Italian town, province of Rome, about 20 m. n.n.w. of the town of Viterbo. It is on the n. shore of the Lake of Bolsena (*Lacus Volsiniensis*), on the road from Florence by Siena to Rome. It has now little

BOLSTER—BOLT.

more than 2,000 inhabitants; but in early ages it was a place of great importance, being one of the 12 Etruscan cities, under the name of Volsinii. When finally subjugated by the Romans (B.C. 280), as many as 2,000 statues are said to have been taken from it; but, though this is doubtless an exaggeration, we may gather from it that the Volsinians had high repute for wealth and artistic skill. The Romans razed the Etruscan city to the ground, but built another in its place, which, however, is not much celebrated in history, except as the birthplace of Sejanus, the favorite and minister of Tiberius. Pliny records that it was the scene of supernatural occurrences, King Porsenna having here called down fire from heaven to destroy a monster, Volta, that was ravaging the surrounding country. In later ages, according to the traditions of the Rom. Cath. Church, a doubting Bohemian priest was here convinced of the truth of the doctrine of transubstantiation, by witnessing the flow of blood from the Host he was consecrating; and in commemoration of this supernatural occurrence, Urban IV. instituted the festival of the Corpus Domini. Raphael has immortalized the incident. Half a mile from B. are a few traces of the Etruscan city, and many fragments of the Roman one remain. The Lake Bolsena is a fine expanse of water about 10 m. long and 8 broad, but its shores are very unhealthful. The Marta river carries its waters into the Mediterranean. It has two islands, Bisentina and Martana, favorite autumnal retreats of Pope Leo X.

BOLSTER, n. *bōl'stēr* [AS. *bolster*, a cushion: Dut. *bolster*, the chaff of corn: Icel. *bolstr*; Ger. *polster*, a cushion: Sp. *bulto*, and *bolsa*, a bag, a swelling—*lit.*, the materials of which a bolster is made]: a long pillow or cushion for laying the head on in bed; a pad for support; a quilt; a tool for punching holes and making bolts: V. to support; to hold up. **BOL'STERING**, imp. **BOL'STERED**, pp. *-stērd*. **BOL'STERER**, n. *-stēr-ēr*, one who.

BOLSWARD, *bōls vārt* (Lat. *Bolwerda*): old town in the Netherlands, province of Friesland, 15 m. s.w. from Leeuwarden. It is surrounded by a high earthen wall and broad canal. The church of St. Martin, in the Gothic style, is the largest and handsomest in Friesland. There are several benevolent institutions, and a grammar-school. The trade is chiefly in butter, cheese, and cattle. Ship-building, tanning leather, making brick and coarse pottery, spinning worsted, carding wool, etc., are the principal industries. Pop. (1880) 5,613; (1890) 5,937.

BOLT, n. *bōlt* [mid. L. *bo'ta*, a javelin: Ger. *bolzen*, a crossbow bolt: Swiss, *bolz*, an upright beam on another: F. *boulon*, a big headed peg of wood: Dut. *bult*, a nob or hump]: a broad-headed peg to fasten one object to another; an arrow; a dart; a small round bar of wood or metal; a stream of lightning; a meteoric stone: in *ship-building*, a small round bar of metal for fastening timbers, varying from half-an-inch to nearly three inches in diameter, and from a few inches to many feet in length: some of the smaller are

secured at the points by riveting, clinching, or fore-locking: V. to fasten with a bolt; to make secure; to utter or throw out precipitately; to spring out or run away with swiftness; to fly from justice or pursuit. BOLT-AUGER, an auger used by ship-wrights in sinking holes for bolts. BOLT-CUTTER, in *mach.*, a tool for cutting off bolts; a machine for cutting the thread on bolts. BOLT-ROPE, the rope which goes round the border of a sail, and to which the canvas is sewed: it is of three kinds according to its position—a *leech* rope up the perpendicular edge of the sail, a *foot*-rope along the bottom of the edge, and a *head*-rope along the top edge. All the cordage for furling and unfurling the sail is fastened to the *bolt-rope*. BOLT-SPRIT—same as BOWSPRIT, which see. BOLT-UPRIGHT, perpendicular; straight upright, as an arrow. BOLT AND NUT, a metal pin having a broad head at one end, and a nut working upon a screw-thread on the other.

BOLT, v. *bōlt* [Ger. *beuteln*, to bolt meal—from *beutel*, a bag: F. *bluter*; OF. *beluter*, to bolt meal—from mid. L. *buletārē*, to sift meal—from OF. *buire*; mid. L. *burra*, coarse woolen cloth]: to separate the bran from the flour by shaking the mass backward and forward in a cloth of loose texture. BOLT'ING, imp.: N. the process of separating the bran from the flour. BOLT'ED, pp. BOLT'ER, n. one who or that which. BOLT-HEAD, a matrass or receiver; a sifting apparatus; a round glass vessel with narrow-necked openings. BOLT'ING-HUTCH, *-hūch*, the bin or tub for the bolted meal. BOLT'ING-TUB, a tub to sift meal in. To BOLT THE BRAN, to sift out the bran; to sift and examine thoroughly. To BOLT FOOD, to swallow food quickly without chewing it.

BOLTER: see BLOOD-BOLTERED.

BOL'TON (-LE-MOORS): important English manufacturing town, in South Lancashire, on the Croal, 11 m. n.w. of Manchester. It was celebrated as far back as the time of Henry VIII. for its cotton and its woolen manufactures, introduced by Flemish clothiers in the 14th c. Emigrants from France and the Palatinate of the Rhine subsequently introduced new branches of manufacture; and the improvements in cotton-spinning of the middle of the 18th c. rapidly increased the trade of the town. Though Arkwright and Crompton belonged to B., the opposition of the working-classes long retarded the adoption, in their native town, of their inventions—the spinning-frame and the mule. B., containing more than 100 cotton-mills, with 4 million of spindles, is now one of the principal seats of the cotton manufacture in Lancashire. Muslins, fine calicoes, quiltings, counterpanes, dimitics, etc., are manufactured. Since 1832, it has returned two members to parliament. B. parish has numerous coal-mines. There are 40 foundries and iron-works, and numerous dye-works. The town-hall, of Corinthian architecture, which cost in all £166,000, was opened 1873. During the civil war the parliament garrisoned Bolton; in 1644, it was stormed by the Earl of Derby. Pop. (1901) 168,205.

BOLTON.

BOLTON, *bōl' ton*, HENRY CARRINGTON, PH.D.: chemist—1843, Jan. 28—; b. New York. He graduated at Columbia College 1862; studied chemistry in Paris and at the univs. of Berlin, Göttingen, and Heidelberg; was instructor in quantitative analysis at Columbia Coll. 1872-77, and 1875-78 prof. of chem. in the Woman's Med. Coll. of the New York Infirmary: he resigned those posts and was (1878-87) professor of chem. and nat. science in Trinity Coll., Hartford, Conn. His most notable original investigation had to do with the action of organic acids on minerals; his doctoral thesis at Göttingen 1866 was on the *Fluorine Compounds of Uranium*. It was at B.'s suggestion, and mainly through his exertions, that the 'centennial of chemistry' was celebrated 1874 at Northumberland, Penn., the home of Dr. Joseph Priestley, discoverer of oxygen 1774. Dr. B. has collected the fullest private library in the United States of early works on chemistry. He has contributed largely to the literature of chemical science by communications to chemical journals, and by compilations and text-books.

BOLTON, SARAH (KNOWLES): author: 1840, Sep. 15—; b. Farmington, Conn. In early childhood she showed a taste for reading, and soon developed an aptitude for mathematics and science. She graduated at the Hartford Seminary, founded by Catharine E. Beecher; and married 1866 Charles E. B., A. M., (b. Mass., 1841); merchant, author, and in recent years a popular and instructive lecturer on art, travels, etc. She became a resident of Cleveland, O., where she was much busied in charitable work. In two European tours she studied educational and social interests, profit-sharing, and the mental and moral condition of working people. For three years she was on the editorial staff of the *Congregationalist*, Boston. Her contributions to periodicals and her many books show a well-furnished mind, trained observation, discriminating judgment and a gift of clear and pleasing expression. Miss Frances E. Willard characterizes her as 'the chief Woman Biographer of our times.' Mrs. B. is author of *How Success is Won* (1884); *Poor Boys Who Became Famous* (1885); *Girls Who Became Famous* (1886); *Stories from Life* (fiction 1886); *Social Studies in England* (1886); *Famous American Authors* (1887); *From Heart and Nature* (poems, half of them by her son, (1887); *Famous American Statesmen* (1888); *Some Successful Women* (1888); *Famous Men of Science* (1889); *Famous English Authors of the Nineteenth Century* (1890); *Famous European Artists* (1890); *Famous English Statesmen of Queen Victoria's Reign* (1891); *Famous Types of Womanhood* (1892); *Famous Voyagers and Explorers* (1893); *Famous Leaders Among Men* (1894).

BOLTON, SARAH TITTLE (BARRETT): poet: 1815, Dec. 18—1893, Aug. 4; b. Newport, Ky.; dau. of Jonathan B. Barrett, and wife of Nathaniel B., editor of a newspaper, for which she wrote verses when she was 16 years of age. She passed two years in Geneva, where her husband was consul 1855, during which period she contributed to the American press. Certain of her poems have achieved popularity, including *Paddle Your Own Canoe*, and *Left on the Battlefield*. Her poems were collected and published 1886.

BOLTON PRIORY—BOMB.

BOLTON PRIORY, *bōl'tun*: built abt. 1150, for Augustinian canons; in a highly picturesque district on the river Wharfe, about 6 m. from Ilkley, Yorkshire. The remains are partly Transition Norman; of the church only the nave (restored) is perfect. The old barn of the priory is still in use, and an old gateway has been incorporated in Bolton Hall, a seat of the Duke of Devonshire.

BOLUS, n. *bō'lūs* [L. *bolus*, a mass: Gr. *bōlos*, a lump]: a soft mass of medicine to be swallowed at once like a pill, but larger.

BO'MARSUND: see **ALAND ISLANDS**.

BOMB, n. *bŭm* [L. *bombus*, a humming or buzz: F. *bombe*; It. *bomba*, a bomb—from an imitation of the noise of the explosion]: a hollow iron ball filled with gunpowder and fitted with a fuse, and fired from a mortar; a stroke on a bell. **BOMBARD**, v. *bŭm-bārd'* [F. *bombarde*—from *bombe*]: to throw bomb-shells, etc., into a town or fortified place in order to destroy it or cause its surrender: N. in *OE.*, a cannon; a barrel for liquor. **BOMBARD'ING**, imp. **BOMBARD'ED**, pp. **BOMBARD'MENT**, n. a military attack made upon a city, etc., or a fortified place by throwing shells into it from a distance. **BOM'BARDIER'**, n. *-bār-dēr'*, a soldier in the Brit. artil. ranking above a private, versed in that department of arms which relates especially to bombs and shells, mortars and howitzers, grenades and fuses. He has learned to load shells and grenades, fix fuses, prepare composition for fuses and tubes, etc.; and on the field or at sieges, he fires the mortars. **BOMB-KETCH**, or **BOMB-VESSEL**, a strong ship from which bombs can be thrown into a town or fortress from sea: see **MORTAR VESSEL**. **BOMB-PROOF**, a building sufficiently strong to resist the explosive force and weight of bombs falling vertically or nearly so: see **CASEMATE**: **MAGAZINE**. **BOMBS**, n. plu. old name of bomb-vessels.

BOMB: a missile which has also the names *bomb-shell* and *shell*. It is a hollow ball, usually of cast-iron, fired from a mortar or other large piece of ordnance, and filled with combustibles which work great havoc when the ball bursts by the firing. All such projectiles were formerly fired from mortars only, and there was thus a definite relation between the B. and the mortar; but since the invention of shell-guns, and other modern pieces of artillery, the name *shell* has been generally substituted for that of *bomb*. The 13-inch B., the largest size used in ordinary warfare (instances of exceptional magnitude are noticed under **MORTAR**), weighs about 195 lbs., with a thickness of metal varying from 1½ to 2 inches at different parts; it bursts with about 8 lbs. of powder. The vent through which it is filled with powder is, after the filling, closed with a plug called a *fuse*, which sets fire to the powder, which at the proper moment bursts the B. into fragments. The 10-inch B., weighing about 90 lbs., is proportionably less in all dimensions than that just described; and so on for those of smaller diameters. It should be understood, however, that the above are conventional quantities prescribed and adopted more than half a century ago. Modern artiller-

BOMBA—BOMBARDMENT.

ists try experiments on bombs of various degrees of thickness, and various charges and fuses: see MORTAR and SHELL.

BOM'BA: nickname given to Francis II., King of Naples and Sicily, in consequence of his cruel bombardment of Messina, 1848, Sep., with great slaughter and destruction of buildings.

BOMBA'CEÆ: see STERCULIACEÆ.

BOMBARD, būm'bard: among the now disused engines of war: a piece of ordnance very short, thick, and wide in the bore. It differed from the Ballista (q.v.) in being worked with gunpowder instead of by mechanical force; and from the mortar, in shooting forth stones instead of iron shells. Some of the bombards used in the 15th c. propelled stones weighing from 200 to 500 lbs. each.

BOMBARDIER' BEE'TLE: name common to many species of Coleopterous (q.v.) insects of the genera *Brachinus* and *Aptinus*, of the tribe *Carabidæ* (q.v.). They have received this name in consequence of the remarkable power which they possess of discharging, for their own defense, an extremely acrid volatile fluid from the abdomen, which diffuses around them a pungent odor, and which explodes on coming in contact with the air. The species of the genus *Aptinus* have no membranous wings beneath their elytra; those of the genus *Brachinus* have. Both are found chiefly under stones. The larger and more brilliant species are tropical. Several small species of *Brachinus* are natives of England. The most common English species is only about four lines long. When roughly handled, it will make more than a dozen discharges in rapid succession. When the reservoir which contains the liquid is opened by dissection, it effervesces and evaporates instantaneously. It changes blue vegetable colors to red, and then to yellow; produces sharp pain when applied to the tongue; and leaves a yellow spot upon its surface, like that produced by a drop of nitric acid.

BOMBARD'MENT: attack upon a fortress or town by means of shells, red-hot shot, carcasses, rockets, etc., to burn and destroy the buildings and kill the people. A B. is most likely to be successful when the place is destitute of bomb-proof cover; or when the governor is too humane to expose the unoffending inhabitants to this dreadful ordeal; or when the population is strong enough to compel him to yield. A B. requires little engineering science; whereas to reduce a place by regular siege requires the work of engineers to direct the attack against fortifications, guns, and soldiery, leaving the inhabitants and buildings untouched. Military engineers generally regard a B. as a cruel operation; it is especially directed against the civilians and their buildings, as a means of inducing or compelling the governor to surrender the place, and terminate their miseries. In a well-defended place, the soldiers, the ammunition, and the defense-works suffer comparatively little, seeing that the bombardiers aim at pitching their terrible missiles into the heart of the place. In modern times, a B.

BOMBAST—BOMBAY.

is mostly adopted as an adjunct to a siege, distracting the governor by an incessant fire of mortars day and night. At Sebastopol, for instance, the mortars fired shells into the centre of the city, to weaken the defense of the forts which were cannonaded by the siege-guns. In 1871, Jan., the Germans bombarding Paris and its forts, threw 10,000 shells daily into the place, of which 500 fell in the city itself. The B. of the forts of Alexandria by the Brit. fleet 1882, July 11, is an example of the effect of the enormous modern shells. It was directed against the fortifications, not against the town, and the forts were silenced in 24 hours.

BOMBAST, n. *būm-bast* [It. *bambagia*, cotton: Gr. *bombux*, raw silk: Pers. *bandash*, carded cotton]: originally a soft loose stuff used to swell out garments; an inflated swelling style in speaking or writing. **BOMBAS'TIC**, a. *būs'tik*, high-sounding; big and puffing without much meaning. **BOMBAS'TICALLY**, ad. *-kāl-ī*.

BOMBAX: see **SILK-COTTON TREE**.

BOMBAY, *bōm-bā'*: island of 8 m. by 3, on the w. of Hindustan, having its s. extremity in lat. 18° 57' n., and long. 72° 52' e. It consists of two rocky ridges, which embrace a valley so low as to require embankments against the tide. Its productions are scanty and unimportant. The rain-fall, with an annual mean of 80 inches, gave, in 1831, 99·64, and in 1838 only 50·78. The temperature, ranging between 70° and 100°, averages, during the year, about 80°. The climate was formerly very unhealthful; but the place has latterly been so much improved by drainage and other appliances that, in favorable seasons, the proportion of deaths is said very little to exceed that of London. In 1509, about a year before the capture of Goa, the Portuguese visited the island; and by 1530, they had made it their own. In 1661, they ceded it to Charles II. of England, as part of the dowry of his bride, the Infanta Catherine. In 1668, Charles II. granted it to the East India Company, which in 1685, transferred what was then its principal presidency to B. from Surat. The name of the island, though manifestly a corruption of the native *Mumbai*, may yet, with reference to the goodness of the harbor, have owed its specific form to the Portuguese *buon bahia*. The bay toward the mainland, even in its natural state, presents one of the finest havens in India, more particularly as being one of the few on the e. side of the Arabian Sea which are accessible during the s.w. monsoon. Anchoring-ground, of about 50 sq. m., available for vessels of any burden, is sheltered on the n. by Trombay and Salsette, and on the w. by B. itself and its two insular appendages—Old Woman's Isle and Colaba; and lastly, the open passage at the s., which thus makes an entering wind of the monsoon already mentioned, is narrowed on the e. by the island of Caranja. Art also has done much to aid nature. The islands on the n. and w.—all but Trombay, which, in fact, is itself inclosed—are welded into one by three causeways; while at the s. end of this continuous breakwater, the light-house

BOMBAY.

of Colaba, 150 ft. high, indicates to mariners the entrance of the port along a radius of 20 miles.

BOMBAY': city occupying the entire breadth of the s. end of the island of B., bordering both on the harbor inside, and on Back Bay outside. Next to Old Woman's Isle, which with Colaba may be regarded as a suburb, is the European town; about a mile to the n. is the much larger Black Town; and between them is the esplanade with the barracks and the railway terminus. Amid the various classes of the population, Parsees or Persians, descendants of fire-worshippers driven from their homes by Mohammedan bigotry, rank next to the English, grade for grade, in respectability and influence. The late Sir Jamsetjee Jeejeebhoy, in fact, stands forth as the faultless model of a merchant-prince in enterprise and integrity, in munificence and patriotism—having also fabulous wealth; and ever since the introduction of the ship-building business, 1735, the Lowji family, assisted chiefly by operatives of the same race, has been at the very head of this, one of the most important interests of the city—not merely the Indian navy, to be noticed more at large under the next subdivision, but likewise several imperial men-of-war, both frigates and line-of-battle ships, having been almost exclusively the work of Parsees. Besides the dockyard, which covers about 200 acres, at the s.e. of the European town, the objects most worthy of note are the town-hall, the Library of the Asiatic Society, the Mint, Cathedral, and Custom-house; the Post-office, and Public Works Office; the Missionary Houses, the Elphinstone Institution, the Grant Medical College, the University, and Sassoon's High School; the Jamsetjee Hospital, and the Jamsetjee Obstetric Hospital. The city also has a Chamber of Commerce, offices of the Agra Bank, Government Savings Bank, B. Steam-navigation Co., and several insurance companies. Always favorably situated for foreign trade, B. has profited largely by the reopening of the ancient thoroughfare through Egypt, as saving more distance in proportion than any other emporium in the East, and also as being on the direct line between Madras and Calcutta on the one side, and Aden on the other. When the rebellion in the United States caused a sudden cessation of the American supplies, cotton began to be exported from B. in vast quantity; and although the re-opening of the southern ports soon checked the extraordinary activity of trade, B. was permanently benefited by the stimulus its commerce then received. It now presses Calcutta closely as the commercial capital of India; in 1880-1, 42·17 per cent. of the trade of India was done through Calcutta, and 39·53 through Bombay. Chief articles of export are cotton, shawls, opium, coffee, pepper, ivory, and gums; chief imports, piece-goods, thread, yarn, metals, wine, beer, tea, and silk. The principal mail line to India is now by Suez, Aden, and B.; and from B., letters are sent on by rail. In 1893, Aug., the religious differences between the Mohammedan and Hindu residents in the city were intensified by the occurrence of a Mohammedan day of prayer and a

BOMBAY.

Hindu holy-day on the same day. Rioting broke out and was continued a week before the military and police forces could suppress it. Pop. (1901) 776,006, of whom about 500,000 are Hindus and 160,000 Mohammedans.

BOMBAY: a presidency in British India. It has gained its present importance mainly in the present century. During 90 years, it was confined, with now and then a temporary and insignificant exception, to the island and the two rocky islets on the s. Even the adjacent islands, such as Salsette and Caranja, were acquired only in 1775—the very year in which a younger presidency, after absorbing Bengal, Bahar, and Orissa, annexed Benares. With the exception of the detached territory of Sinde, the presidency of B., reared principally at the expense of Mahratta dominion, physically divides itself into three parts: the two Concans, between the Western Ghauts and the Arabian Sea; the e. slope of the Western Ghauts; and, n. of both these divisions, the alluvial tracts toward the mouths of the Taptee and the Nerbudda. Of these three regions, the first, though in a higher latitude than the second, is by far the hottest—its temperature occasionally reaching 115° . The first two differ widely as to rainfall. In the Concans, the vapors of the s.w. monsoon, intercepted by the mountains, have been known to yield, at three different places in the same year, 106, 130, and 248 inches; while, almost as a necessary consequence, the e. slope is generally liable to suffer from droughts. For details of the respective districts, see their titles. The administration is vested in a governor and three councilors, subject, however, to the control of the gov.gen. of India. The ecclesiastical establishment consists of a bishop of the Church of England, who has under him an archdeacon and many clergymen; and a number of chaplains of the Church of Scotland. The schools are of two classes—seminaries under the various missions, and schools managed by a board of education—the latter being by far the more numerous. The majority of the scholars use merely the vernacular tongues. In 1880–85, the entire number of schools and colleges aided by government, or under its inspection, was 6,726, with 438,416 pupils; and there are 290 girls' schools. The Univ. of B. was founded 1857; 840 candidates passed for admission in 1885. There were 90 libraries, and 75 newspapers (66 vernacular), in 1879–80. During the mutiny of 1857, the local army remained, on the whole, steady and faithful; and it was, in fact, a portion of it which, under Sir Hugh Rose, acted, if not actually the first, at least the second part in the suppression of the insurrection. It is to this presidency that the naval force for all the presidencies belongs. To the island of Bombay, as to Great Britain itself, 'wooden walls' were from the beginning a necessary of life, more especially on waters proverbial for piracy from time immemorial. Accordingly, from 1670 onward, the company's navy have done battle for the crown. B. has benefited vastly from the establishment and extension of the Indian railway system. The first railway in Hindustan was opened in B. 1853. There are now five main railway lines in B., giving direct communication with Ahmedabad,

BOMBAY ARMY—BONA.

Calcutta, and Madras. A cable telegraph from B. to Aden was laid 1869. Of late years, the manufacturing industries have been extremely active in B. Silk, paper, and cotton mills have been erected; and the presidency, commanding the richest cotton-fields in India, has improved to the utmost its natural advantages, by adding English machinery to its cheap labor and ready material. Government has been liberal in supplying money for public works.

The revenue 1890 was 130,862,880 rupees; the expenditure, 88,887,210 rupees. B., including Sindé, contains 123,064 sq. m., of which 66,319 are in native states; pop. (1901) 18,559,561, including the territory and city of Aden in Arabia (80 sq. m.; pop. 43,974).

BOMBAY ARMY: see EAST INDIA ARMY.

BOMBAY DUCK: see BUMMALOTI.

BOMBAZIN, BOMBAZINE, BOMBASIN, or BOMBASINE, n. *bòm'bà-zèn'* [F. *bombasin*, a cotton stuff: L. *bomby-cinus*, silken: Gr. *bombux*, the silk-worm]: twilled cloth, for dresses, in which the warp is usually silk and the weft worsted, or sometimes cotton. The cloth has thus a bare look. It is rather fine and light in weight, and may be of any color; and is about 24 inches in width. The fabric, now little used, was extensively made, chiefly at Norwich, from about 1816.

BOMBERGER, *bòm'bér-gér*, JOHN HENRY AUGUSTUS, D.D., LL.D.: theologian of the German Ref. Chh.: 1817, Jan. 3—1890, Aug. 10. After graduating at Marshall Coll. 1837, and at Mercersburg Theol. Sem. 1838, he entered the ministry, and 1854–70 was pastor of First Ref. Chh., Philadelphia. Thereafter, till his death, he was pres. of Ursinus Coll., Collegeville, Penn. He edited a condensation and translation (2 vols.) of Herzog's *Encyclopedia*; was editor of the *Reformed Church Monthly* 1868–75; translated Kurtz's *Handbook of Church History* (2 vols. 1860–62); and was author of *Infant Salvation and Baptism* (1860).

BOMBIC, a. *bòm'bík* [L. *bombyx*; Gr. *bombux*, the silk-worm]: relating to the silk-worm. BOMBYC'INOUS, a. *-bìs'ì-nūs*, silken; of or like the silk-worm.

BOM'BYX: s.e SILK-WORM.

BOM JARDIM, *bông-zhar-dông'* (Good Garden): town of Brazil, province of Ceara. Pop. 6,000.

BOM'MEL (Dutch, *Zalt-Boemel*): pleasant town in the Netherlands, province of Gelderland.

BOMMELERWAARD, *bòm'mel-er-vàrt*: island in Dutch Gelderland, formed by the Waal and Maas. It contains 12 parishes; is 16 m. in length, greatest breadth 6 m. Two thirds of the people are Protestants. The district is extremely fertile, and besides other farm produce, flax and hops are largely grown. The town of Bommel and many thriving villages are on the island. Fort St. André defends it on the e., and Fort Loevesteen on the w. Pop. 19,056.

BONA, *bo'nâ*: seaport town of Algeria, province of Constantine, on a bay of the Mediterranean, lat. 36° 54' n., long. 7° 46' e.; known among the Arabs by the name of

Beled-el-Areb. The town, divided into two parts, Upper and Lower B., is in a beautiful but unhealthful district, at the foot of a hill near the embouchure of the Sebus; is surrounded by walls flanked with square towers, and further defended by Fort Cigogne, on the top of the hill. Since the occupation of B. by the French, 1832, the town has been much improved, and has now good bazaars, shops, markets, reading-rooms, etc.; manufactures of tapestry, saddlery, and native clothing; and a trade in wool, hides, corn, coral, and wax. A telegraph cable was laid between B. and Marseille, 1870; and there is regular steam communication with France, Algiers, and Tunis. Among the public buildings, the Rom. Cath. church and the convent of the Sisters of Mercy are most remarkable. Near B. are some scanty remains of the once famous city Hippo Regius, the favorite residence of the Numidian kings, and the episcopal seat of St. Augustine, who died here, 430. This city was probably connected with the ancient *Aphrodisium* (the present Bona) by a canal, of which the outline may still be seen in a morass. Hippo Regius, in early Christian times, was the central station of commerce and civilization in n. Africa, and was celebrated for its schools, theatre, aqueducts, palaces, and temples, afterward changed into churches and monasteries. It was totally destroyed by the Mohammedans under the Caliph Osman, 646. Pop. of B. (1901) 32,288.

BO'NA: a Latin vocable, literally signifying 'goods,' and often used in pleading at law, and otherwise technically, to designate personal estate, has several applications in the law of England, of which the following are instances: *Bona Confiscata* are forfeitures of lands and goods for offenses, and form a branch of the ordinary revenue of the crown.—*Bona Notabilia* are chattels to the value of 100 shillings, or personal estate of £5 or upward, excepting in London, where the sum is £10.—*Bona Vacantia*, or stray goods—such as wrecks, treasure-trove, waifs, and estrays, contrary to the general rule, which gives such things to the finder—vest in the crown.—*Bona Waviata* are also given to the crown. They consist of goods waived or thrown away by a thief in his flight, for fear of being apprehended.

BO'NA DE'A (the good goddess): a mysterious Roman divinity, variously described as the wife, sister, or daughter of Faunus. She was worshipped at Rome from the most ancient times, but only by women, even her name being concealed from men. Her sanctuary was a grotto on Mons Aventinus, which had been consecrated to her by the virgin Claudia: her festival, however (May 1), was celebrated not there, but in the house of the consul, inasmuch as the sacrifices were then offered up for the whole Roman nation. The solemnities were performed generally by aristocratic vestals. At this celebration, no men or boys were allowed to be present; even their portraits were veiled. The wine consumed was called milk, in order that its name might not be discovered, and the vessel in which

it was served *mellarium*. The symbol of the goddess was a serpent, indicating her healing powers, and certain herbs were sold in her temple.

BONA FIDES, n. *bō'nă fī'dēz* [L. *bona*, good; *fides*, faith]: good faith. BONÂ FIDE, *bō'nă fī'dē*, in good faith; without fraud or deception; real, as 'To give moral support to any *bonâ fide* attempts to redress *bonâ fide* grievances'—that is, 'To give moral support to any attempts (in good faith) to redress (real) grievances.'

BONA FIDES, *bō'na fī'dēz*: a Latin expression literally signifying good faith; entering largely into the consideration of legal questions, particularly matters of agreement, contract, damage, trusts, and other departments of the law; and in all of them it implies the absence of fraud, or unfair dealing or acting. This term, however, does not appear to occupy any formal place in English or American law. It is the foundation of many just and enlightened maxims in the Roman jurisprudence, which 'n this respect, as in many others, has been followed by the legal system of Scotland. In the law of that country, a person who possesses and enjoys property upon a title which he honestly believes to be good, although it may be bad, is protected against the consequences of this illegal position by his *B. F.*, and he is entitled to retain the fruits or profits which he has reaped or received during his *bona fide* occupancy. But such *B. F.* ends when the possessor becomes aware of the insufficiency of his title, whether by private knowledge or otherwise. In the Scotch law, again, while *B. F.* gives no support to the parties, or either of them, in a second marriage, the first subsisting, it would, it is thought, have the effect of rendering the children of such second marriage—that is, children born while the *B. F.* continues—*legitimate*. The reason of this is, that legitimacy in Scotland is not the result merely of a lawful marriage but may be otherwise acquired, and no offense against the laws being intended by one or both of the parties, it is inexpedient to impose bastardy on the issue. The contract itself is null, because, otherwise, a sanction would be given to bigamy. But the contract having been entered into *in bona fide*, the law considers that it ought to attribute to it all the effects of a valid marriage; and such appears to have been the Scotch law from very ancient times. The law of England is not so indulgent, for there children born under such circumstances would certainly be deemed bastards: see BASTARDS—BASTARDY. See also CONTRACT: DAMAGE: MARRIAGE: GUARDIAN: EXECUTOR: TRUSTEE.

BONALD, *bo-nāl'*, LOUIS GABRIEL AMBROISE, Vicomte DE: 1753–1840; b. Monna, near Milhau, in Aveyron: publicist. Compelled to emigrate during the French Revolution, he joined the emigrant corps, and, when it was dissolved, removed to Heidelberg, where he employed his pen in the composition of politico-philosophic works on behalf of monarchy. His first important work, *Théorie du Pouvoir Politique et Religieux* (3 vols., 1796), was seized by the Directory. It prophesied the restoration of

BONAMI—BONANZA.

the Bourbons. Having returned to France, B. was induced to accept the patronage of the Bonaparte family, and in 1808 was appointed minister of instruction. In 1815—as deputy for his department—he voted with the ultramontane or theocratic party in the *Chambre Introuvable* (q.v.), and was one of the most influential members of the chamber of deputies in abolishing the revolutionary law of divorce, against which he had written in 1806; in opposing all projects of electoral reform, the alienation of forests, the efforts for riddance of the Swiss mercenaries, the freedom of the press, etc. In 1823, he was elevated the peerage by Louis XVIII. The July revolution brought his public career to a close, as he refused to take the oath of allegiance to the new dynasty. He died at Monna. His most important writings are: *Législation Primitive* (3 vols., Par. 1802), and *Recherches Philosophiques sur les Premiers Objets des Connaissances Morales* (2 vols., Par. 1818), which have been immensely applauded by his own party. Their non-agreement with the fundamental facts of history has been proved by impartial criticism. His florid and incorrect style is often detrimental to his logic; and even his admirers must admit that his faith in papal infallibility, and his veneration of the Jesuits, were carried beyond all reasonable bounds. A complete edition of his works, in 12 vols., was published under his own supervision (Par. 1817-19).

Hisson, LOUIS JACQUES MAURICE B., Archbishop of Lyon, 1839, made a cardinal 1842, faithfully adhered to his father's political and religious principles: died, 1870, Feb. 24.

BONAMI, *bo-nâ-me'* FRANÇOIS: 1710-86; b. Nantes, France: naturalist. He was rector of the Univ. of Nantes, prof. of botany, and fellow of the Royal Medical Soc. He established at his own expense a botanical garden, where he cultivated the most curious plants. He is the author of *Floræ Nantensis prodromus* (1782-85, 2 vols.), with a supplement that appeared later; also, *Observations concerning a Girl without a Tongue, that Spoke, Swallowed, and Performed All the Other Functions depending upon that Organ*.

BONAMY, *bo-nâ-me'*, CHARLES AUGUST JEAN BAPTIST LOUIS JOSEPH: 1764-1830; b. Fontenay-le-Comte: French general. He served with distinction during the campaigns of the Republic and of the Empire; and covered himself with glory at Marengo, where he was wounded, at Smolensk, where his brigade was almost annihilated, and at Moscow, where he received twenty wounds made by the bayonet. B. returned to private life after the second restoration. He was the author of a history of the campaign of Naples, and of a *Mémoire sur la révolution de Naples* (1803).

BONANZA, *bō-năn'zâ* or *bôn-ăn'za* [Sp. *bonanza*, prosperity]: rich mass of ore: suddenly discovered but continuous source of prosperity; fortunate stroke. The word came into use in English from the mines and diggings of California. The silver mines on the Comstock lode in Nevada, the yield of which was very large for a few years, got from that circumstance the title of B. mines,

BONAPARTE.

BONAPARTE, *bō'na-pârt*, It. *bo-nâ-pâr'tā*, FAMILY OF. Italian family; later French, and prominent in European history. In the 13th c., and afterward, several families named B. appear in Italian records—at Florence, San Miniato, Sarzano, and Genoa; and toward the close of the 15th c., a branch of the Genoese B. family settled at Ajaccio, in Corsica, where they occupied a respectable position as patricians, *padre del commune* or *cittadini*, in the middle of the 16th c. In the 18th c., this family was represented by three male descendants, all residing at Ajaccio: the archdeacon, Lucien B.; his brother, Napoleon B.; and their nephew, Charles.—For the emperor, see NAPOLEON I.

CHARLES BONAPARTE: 1746, Mar. 29—1785, Feb. 24; father of the Emperor Napoleon. He studied law at Pisa; married 1767—without the consent of his uncles—a beautiful young patrician, named Letizia Ramolino. In 1768, he removed with his family, accompanied by his uncle Napoleon, to Corte, in order to assist General Paoli in defending the island against the French invasion. As the French prevailed, and further resistance was useless, Charles B. attached himself to the French interest, and in 1771 was included by Louis XV. in the election of 400 Corsican families to form a nobility. In 1773, through the influence of Marbœuf, gov. of Corsica, Charles B. was appointed royal counselor and assessor of the town and province of Ajaccio. In 1777, he was a member of the deputation of Corsican nobles to the court of France. In this capacity he resided for some time in Paris, where he gained for his son Napoleon, through the interest of Count Marbœuf, a free admission into the military school at Brienne. In 1779, he returned to Corsica, and in 1785 went to Montpellier, for his health, where he died of cancer in the stomach. He was a man of prepossessing exterior and amiable character. By his marriage with Letizia, he left eight children: Joseph B., King of Spain; Napoleon (q.v.), Emperor of the French; Lucien B., Prince of Canino; Maria Anna (afterward named Elise), Princess of Lucca and Piombino, wife of Prince Bacciochi; Louis B., King of Holland; Carlotta (afterward named Marie Pauline), Princess Borghese; Annunciata (afterward Caroline Marie), wife of Murat, King of Naples; Jerome B., King of Westphalia. These members of the B. family, with the children of Beauharnais (q.v.), adopted by the emperor Napoleon when he married Josephine, are distinguished as the *Napoleonidæ* of modern French history. By a decree of the senate, 1804, Nov. 6, the right of succession to the throne was restricted to Napoleon and his brothers Joseph and Louis, with their offspring. Lucien and Jerome were excluded on account of their unequal marriages. Napoleon intended to give the right of succession also to Lucien, by the additional act of 1815, April 22; but this was never concluded. As Joseph, the eldest brother of the emperor, had no son, the descendants of Louis became nearest heirs to the throne.

MARIA LETIZIA RAMOLINO; 1750, Aug. 24—1836, Feb. 2; b. Ajaccio; mother of Napoleon I.: lived to see her

family placed on the thrones of Europe, and also witnessed their downfall. After the death of her husband, she lived for some time in Corsica, and in 1793, when the island came under British rule, removed with her family to Marseille, where she lived in poverty, mainly supported by the pension given to Corsican refugees. After her son became first consul, she removed to Paris, and when her son was crowned in 1804, received the title Madame Mère. A brilliant court-household was given to her, which, however, was never pleasing to her modest tastes. Remembering former adversities, and foreboding reverses of the splendid success of her sons, she was prepared for all that followed. After the downfall of Napoleon, Letizia lived with her step-brother, Cardinal Fesch, in winter at Rome, and in summer at Albano, and submitted to her change of fortune with remarkable dignity. At her death she left considerable property, the result of saving habits during prosperity.

BONAPARTE, JOSEPH: 1768, Jan. 7—1844, July 28; b. Corte, Corsica: eldest brother of Napoleon. He was educated at Autun. On the death of his father, he returned to Corsica, exerted himself to support the younger members of the family, and removed with them to Marseille, 1793. In 1797 he was elected a member of the Council of Five Hundred, and in the same year was sent as ambassador from the republic to Rome. In 1800, after he had proved his ability in several offices of state, he was chosen by the first consul as plenipotentiary to conclude a treaty of friendship with the United States. He signed the treaty of peace at Luneville, 1801, Feb. 9, and that of Amiens, 1802; and with Cretet and Bernier conducted the negotiations relative to the *concordat*. After the coronation of Napoleon, new honors fell to the share of Joseph B., who was made commander-in-chief of the army of Naples; in 1805, ruler of the Two Sicilies; and in 1806, king of Naples. Though, during his reign, some beneficial changes of government were effected—such as the abolition of feudality, the suppression of convents, the formation of roads, the repression of banditti, the organization of laws, etc.—yet these reforms were not managed judiciously; and the collision that frequently occurred between his own humane endeavors and the reckless promptings of his imperial brother, who looked upon Naples simply as a province of the French empire, exposed only too well to the Neapolitans the weakness and dependence of their new sovereign. But, in truth, he was far too fond of the fine arts to be a vigorous ruler in stormy times; and he is accused of leaving affairs too much in the hands of his minister, the subtle Salicetti. In 1808, Joseph B. was summarily transferred by his brother to the throne of Spain, and Murat took his place as king of Naples. For Joseph, this was no favorable change: he found himself unprepared to cope with the Spanish insurgents, and after the defeat of the French at Vittoria, he returned to his estate at Morfontaine, in France. In 1813, when Napoleon recognized Ferdinand VII. as king of Spain, Joseph B. re-

BONAPARTE.

fused, at first, to abdicate, though he had many times before implored his brother to release him from his royal chains; but he soon submitted, as in all other matters, to the emperor's will.

After the battle of Waterloo, he accompanied Napoleon to Rochefort, whence they intended to sail separately for North America. In his last interview with Napoleon, Joseph generously offered to give up the vessel hired for his own escape, but meanwhile Napoleon had determined to surrender himself into the hands of the English. After a residence of some years at Point Breeze, New Jersey, where he employed himself in agriculture, and was highly esteemed by his neighbors, Joseph B. went to England, 1832, having previously, on hearing of the July revolution, written a letter to the house of deputies, in which he advocated the claims of his nephew, the late emperor of France, and in 1841 was allowed to return to his wife, who had remained in Italy since 1815. He died in Florence. Joseph was the only one of his brothers for whom Napoleon professed to care anything. He was a handsome, intelligent-looking man, distinguished by the elegance of his manners and conversation. His wife, JULIE MARIE CLARY (1777, Dec. 26—1845, Apr. 7), was the daughter of a wealthy citizen of Marseille, and sister-in-law of Bernadotte, King of Sweden. She was a quiet unambitious woman, with no taste for the splendors of royalty, which fell to her share during a few weeks only at Naples, for she never went to Spain. Ill health appears to have prevented her accompanying her husband to America. She died in Florence. By her marriage with Joseph B., she had two daughters—1. Zenaïde Charlotte Julie (1801, July 8—1854), who became the wife of Lucien B.'s son, the Prince of Canino; 2. Charlotte Napoléone (1802, Oct. 31—1839, Mar. 3), who married Louis Napoleon, second son of Louis B., King of Holland; he died 1831, Mar. 17.

BONAPARTE, LUCIEN, Prince of Canino, brother of Napoleon: 1775-1840, June 30; b. Ajaccio; received his education in the college of Autun, the military school at Brienne, and the seminary at Aix. Rising gradually from one office to another, he was elected deputy for the department Liamone, and in the Council of Five Hundred spoke against the squandering of state-property, and formed a party favorable to the views of his brother Napoleon. Shortly before the 18th Brumaire, he was elected president of the Council of Five Hundred, and was the hero of that day. During the ferment which followed Napoleon's entrance, Lucien left his seat, mounted his horse, and riding through the ranks of the assembled troops, called upon them to rescue their general from assassins. Afterward appointed minister of the interior, he was active in the encouragement of education, art, and science, and organized the prefectures. As ambassador to Madrid, 1800, he contrived to gain the confidence of King Charles IV. and his favorite Godoy, thus putting aside the British influence which had until then been exercised at the court of Spain. It is said that for his services in the treaty of peace con-

cluded between Spain and Portugal, 1801, Sep. 29, he received 5,000,000 francs.

His constant opposition to Napoleon's progress toward monarchy involved Lucien in several misunderstandings with his brother; and their quarrel was brought to an issue by Lucien's second marriage against the views of Napoleon. On condition that he would divorce his wife, the crowns of Italy and Spain were offered to Lucien; but he refused them, and preferred living in retirement at his estate of Canino, in the province of Viterbo, near the frontiers of Tuscany, where he gave his time to art and science. Here he had the friendship of the pope, who created him Prince of Canino and Musignano; but having denounced in his private capacity the arrogant and cruel policy of his brother toward the court of Rome, he was 'advised' to leave the city, in which he was at that period residing. In 1810, he took ship for America, but fell into the hands of the English; was taken to England; and after a debate in parliament, was declared to be a prisoner, but treated with distinction. After his brother's downfall, he returned to Rome.

After the defeat at Waterloo, Lucien B. alone seems to have preserved his presence of mind. He immediately advised his brother to dissolve the chambers, and assume the place of absolute dictator. After the second ascent of the throne by Louis XVIII., Lucien lived for some time in and near Rome. In 1830, he went to England, visited Germany 1838, and died at Viterbo. Lucien B. possessed considerable talents and firmness of character. He was in his early years a keen republican, but the weakness of the Directory convinced him that a military consulship was necessary to allay the social anarchy of France. He consequently threw himself eagerly into the designs of his brother, but protested against Napoleon giving way to his desire for a hereditary monarchy. As a writer he was by no means successful. His long and tedious epic poem, *Charlemagne ou l'Eglise Délivrée*, in 24 cantos, was written and published in London, and was dedicated to the pope, 1814. Another heroic poem, *La Cyrnéide ou la Corse Sauvée*, followed in 1819. The *Mémoires Secrets sur la Vie Privée Politique et Littéraire de Lucien B.* (2 vols. Lond. 1819), of which Alphonse de Beauchamp is supposed to be the author, is an untrustworthy book. See Jung, *Lucien B. et ses Mémoires* (3 vols., Par. 1882-83). In 1795, Lucien married Christine Boyer, daughter of a citizen of St. Maximin. After her death, he married, 1803, the widow of a stockbroker, Madame Jouberton, who survived him. By his first marriage, he had two daughters, Charlotte (1796-1865), who married Prince Gabrielli of Rome; and Christine (1798-1847), who married first a Swedish count named Posse, and then Lord Dudley-Stuart. By his second marriage, Lucien had nine children: the eldest daughter, LETIZIA B. (1804-71) married, 1824, Mr. (afterward Sir) T. Wyse, an Irish gentleman; but a separation took place in a few years.—The second daughter, JEANNE B., distinguished by her beauty and taste for poetry, b. 1806, died

soon after her marriage with the Marchese Honorati.—The third daughter, ALEXANDRINE MARIE B. (b. 1818), married, 1836, Count Vincenzo Valentini de Canino, and gave birth to two sons and one daughter.—CONSTANZE, youngest daughter of Lucien B., was born 1823.—CHARLES LUCIEN JULES LAURENT B., eldest son of Lucien B., Prince of Canino and Musignano (1803–1857, July 29; b. Paris), never showed any inclination for political life, preferring the more quiet and wholesome pursuits of literature and science. He acquired considerable reputation as a naturalist, and especially as a writer on ornithology, and was a member of the principal academies of Europe and America. His chief publications are a continuation of Wilson's *Ornithology of America*, and the *Iconografia della Fauna Italica*.—The second son, PAUL MARIE B. (1808–27), took part in the Greek war of liberation, and died by the accidental discharge of a pistol.—The third son, LOUIS LUCIEN B. (b. 1813, Jan. 4), has distinguished himself by his studies in chemistry, mineralogy, and languages, and has lived much in England.—PIERRE NAPOLEON B., the fourth son (1815, Sep. 12—1881, Apr. 8), passed through many changes of fortune in America, Italy, and Belgium, and returned to France 1848. In 1871, he shot a journalist, Victor Noir; and being tried, was acquitted of the charge of murder, but condemned to pay \$5,000 to Victor Noir's relatives.—The youngest son, ANTOINE B. (1816–83), fled to America after an affair with the papal troops in 1836; returned to France, 1848; in 1849 was elected into the national assembly; retired from politics, 1851.

BONAPARTE, LOUIS, third brother of Napoleon: 1778, Sep. 2—1846, July 15; was educated in the artillery school at Chalons, where he imbibed anti republican principles. After rising from one honor to another, he was made king of Holland, 1806; but, in fact, he was never more than a French governor of Holland, subordinate to the will of his brother. Amid all the faults which marked his reign, it must be remembered to his credit that on several occasions he firmly withstood the demands of France; that he replied to one requisition by saying that, since he had been placed on the throne of Holland, he had 'become a Dutchman;' that he nobly refused to accept the tendered crown of Spain; and lastly, that he did not enrich himself during his reign. After the restoration of the House of Orange, Louis considered himself free from all responsibility, and returned to Paris, 1814, Jan. 1., where he was coldly received by the emperor. After living some years in Rome—where he separated from his wife—he removed, 1826, to Florence, where he lived in retirement. On the escape of his son, Louis Napoleon, from the prison of Ham, the ex-king of Holland was removed as an invalid to Livorno, where he died. Louis B. was the writer of several works: *Marie, ou les Hollandaises*, 1814, a novel, giving some sketches of Dutch manners; *Documents Historiques, etc., sur le Gouvernement de la Hollande* (3 vols., Lond. 1821); *Histoire du Parlement Anglais*, 1820; and a critique on M. de Norvin's *History of Napoleon*. Louis B. was married, 1802,

BONAPARTE.

to Hortense Beauharnais, daughter of General Beauharnais (q.v.) by his wife Josephine, afterward Empress of the French. As this marriage was wholly a matter of submission to his brother's will, and put aside a former engagement, it naturally ended in unhappiness and separation.

HORTENSE EUGENIE BEAUHARNAIS, adopted daughter of Napoleon, Queen of Holland, and Countess St. Leu: 1783, Apr. 10—1837, Oct. 3; b. Paris. She was amiable and accomplished. After the execution of her father, she lived for some time in humble circumstances, until Napoleon's marriage with Josephine. In obedience to the plans of her step-father, she rejected her intended husband, Gen. Desaix, and married Louis B. 1802. In 1814, she was the only one of all the *Napoleonides* who remained in Paris. After the Hundred Days, she visited Augsburg and Italy, and then fixed her residence at Arenenberg, a mansion in the canton Thurgau, where she lived in retirement, sometimes spending a winter in Italy. In 1831, when her two sons had implicated themselves in the Italian insurrection, the countess travelled in search of them through many dangers, and found the elder deceased, and the younger, the late Emperor of the French, ill at a place near Ancona. Returning with her son to Paris, she was pleasantly received by Louis Philippe and by Casimir Périer, but was compelled in a few weeks to remove with her son to England. After some stay there, she removed to her country-seat, Arenenberg, where she died, after severe suffering, and was buried near the remains of her mother, Josephine, at Ruel, near Paris. She was the authoress of *La Reine Hortense en Italie, en France, et en Angleterre, pendant l'année 1831*, and wrote several excellent songs. She likewise composed some deservedly popular airs; among others the well-known *Partant pour la Syrie*, which the late Emperor of the French, with a delicate union of political tact and filial pride, made the national air of France. Of her three sons, the eldest, NAPOLEON LOUIS CHARLES (1803—07, Mar. 6), died in childhood. The second, LOUIS NAPOLEON, Crown-Prince of Holland (1804—31, Mar. 17), married his cousin Charlotte, daughter of Joseph B., and died at Forli. The third, CHARLES LOUIS NAPOLEON, became Emperor of the French: see LOUIS NAPOLEON.

BONAPARTE, JEROME, youngest brother of Napoleon: 1784, Nov. 15—1860: after receiving his education in the college at Juilly, served as naval lieut. in the expedition to Hayti. When war broke out between France and England, 1803, Jerome was cruising off the West Indies, but he was soon compelled to take refuge in the port of New York. While in America, he married Elizabeth Patterson, (q.v.), dau. of a merchant in Baltimore, 1803, Dec. 27. Subsequently, he was employed by Napoleon in the liberation of Genoese prisoners who had been captured by the dey of Algiers. In the war with Prussia, he commanded, in concert with General Vandamme, the tenth corps in Silesia, and, 1807, Dec. 1, was made king of Westphalia. He was recognized with great pomp at Cassel, where he lived in splendor, caring very little for government, not even tak-

ing pains to acquire the vernacular language of the country. After the war with Austria, the finances of Westphalia, through mismanagement, plunder, and extravagance, as well as war-expenditure, were found in an exhausted condition. The battle of Leipsic brought the reign of Jerome to a close. After the peace of 1814, he left France, and resided in Switzerland, at Grätz, and in the beginning of 1815, at Trieste. He was made a peer when Napoleon returned from Elba, and fought by the side of the emperor at Ligny and at Waterloo. After his brother's abdication, he left Paris, June 27, and visited Switzerland and Austria, but ultimately settled in Florence. His request to be allowed to return to France was rejected 1847, by the chamber of peers, but was afterward granted, and at the outbreak of the February revolution Jerome B. was in Paris, where he was appointed governor of the Invalides 1848, and in 1850 was made a French marshal.

His marriage with Elizabeth Patterson having been declared null by Napoleon, Jerome was forced, after he had gained the Westphalian crown, to marry Sophia Dorothea, daughter of King Frederick I. of Würtemberg. After the battle of Waterloo, her father wished to annul the marriage, but the wife of Jerome declared her resolution to share through life the fortunes of her husband. Jerome B. had one son by his first marriage (see below), and had three children by his second wife.—JEROME B., elder son (1814, Aug. 24—1847, May 12).—MATHILDE LETITIA WILHELMINE B., Princess of Montfort (b. Trieste, 1820. May 27), married the Russian Count Anatol Demidov, and lived with her husband at the court of Louis Napoleon during his presidency.—The younger son, NAPOLEON JOSEPH CHARLES PAUL B. (see NAPOLEON, JOSEPH, etc.) (1822–91), married 1859 Princess Clotilde, by whom he had two sons and a daughter, and his eldest son became 1879 the heir of the Bonapartist hopes.

JEROME NAPOLEON B., (1805–70, b. Camberwell, England), son of Jerome B. by Elizabeth Patterson, graduated at Harvard 1826, then studied law, but never engaged in legal practice; nor was he ever naturalized as a citizen of the United States, though he resided all his life in Baltimore, Md., maintaining intimate relations with the Bonaparte family. By his management of his inherited fortune and of the estate that came to him by marriage, he became one of the richest men in Baltimore. He left two sons, who inherited his wealth as well as that of their grandmother at her death 1879.—JEROME NAPOLEON B. (1830–93, b. Baltimore), son of Jerome Napoleon B., graduated at West Point 1852, and receiving the commission of 2d lieut., served on the Tex. frontier. He resigned 1854 and was commissioned lieut. of dragoons in the French army. In the Crimean war he gained distinction at Balaklava, Inkerman, and Tchernaiia, and received many decorations. His next service was in Algeria. In the Italian war between France and Austria he distinguished himself in the battles of Montebello and Solferino and in several skirmishes. He became *chef d'escadron* 1865, and was transferred to Em-

BONAPARTEAN—BONAR.

press Eugenie's dragoon guards. He returned to the United States 1871. He d. at Beverly, Mass.—His bro., CHARLES JOSEPH B. (b. Baltimore, 1851, June 9), son of Jerome Napoleon B. (first), graduated at Harvard 1871 and at the Harvard Law School 1874, and adopted the law as a profession, in Baltimore.

For Emperor B., see NAPOLEON I.

BONAPARTEAN, a. *bō-na-pârt'e-an*: pertaining to any of the Bonapartes. Bo'NAPARTISM, n. *-izm*, the views or procedure of the house of Bonaparte. Bo'NAPARTIST, n. *-ist*, supporter of the Bonaparte family, especially of Napoleon I. or III.; or a partisan of their dynasty.

BONA-PERITURA, n. *-pēr-ĭ-tō'ra*, [L.]: in law, perishable goods.

BONAR, *bō-nâr*, HORATIUS, D.D.: clergyman of the Free Chh. of Scotland, prolific author, and hymnologist: 1808, Dec. 19—1889, July 31; b. Edinburgh. After graduating at Edinburgh Univ., he was minister at Kelso 1838-66, leaving, with his congregation, the Established Chh. of Scotland 1843; and pastor of the Grange Free Chh., Edinburgh, from 1866 till his death. Biblical prophecy has engaged his study. He has published many sermons, tracts, etc. His daughter married the Rev. G. Theophilus Dodds, and with him labored earnestly in the McAll mission, Paris (see Dr. B.'s *White Fields of France*). Of his hymns—many of which breathe a tender and beautiful devotion—the three most noteworthy collections are *Hymns of Faith and Hope* (3 vols. 1857-71); *The Song of the New Creation, etc.*, (1872); *Hymns of the Nativity* (1878).

BONASA —BONAVENTURA.

BONASA, *bō-nā'sā*: genus of gallinaceous birds of the Grouse (q.v.) family or *Tetraonide*, perhaps more properly only a sub-genus of Grouse (*Tetrao*), distinguished by having the toes and the lower part of the tarsus (or shank) destitute of feathers; also by the elongated feathers of the upper part of the head. To this genus belongs the Hazel Grouse of the continent of Europe (*Tetrao Bonasia* of Linnæus), a species which, though not found in Britain, is very widely distributed from Siberia to Africa, and throughout that continent. In size, it scarcely exceeds the common partridge, is prettily mottled with gray and reddish brown, and has a black band near the extremity of the lateral tail-feathers. It prefers the deepest solitudes of forests. The eggs are 12-18 in number. The flesh of this bird is highly prized, and German etiquette has long assigned it a place above all other dishes at the tables of princes, as the only dish which may be served twice in succession. Another species of B. is the Ruffed Grouse of America (*B. Umbellus*, or *Tetrao Umbellus*), known also in some parts of the United States by the names of Pheasant and Partridge. It is nearly equal in size to the black-cock of Europe. Besides having the feathers of the upper part of the head elongated, the male has a large shoulder-tuft on each side. This bird is found in almost all parts of N. America, from the Gulf of Mexico to Hudson's Bay, and from the Atlantic to the Pacific. It is polygamous, and in spring the males make a noise called *drumming*, by rapid clapping of their wings, to attract the attention of the other sex, while they also strut with erected ruff and tail, and with wings depressed, after the manner of the turkey-cock. At this time they have fierce battles with one another, and advantage is sometimes taken of their jealous pugnacity to attract them within shot, by an imitation of their drumming, accomplished by means of a bladder and a stick. The nest is formed on the ground in the woods, often under a bush, and 5-12 eggs are laid in it. The flesh of the Ruffed Grouse is much esteemed, and the markets of cities and towns are well supplied with it in winter.

BONASUS, n. *bō-nā'sūs* [L. *bonāsus*]: an animal of the ox kind, having a mane like a horse, found in Lithuania, in Europe; the *bison* or *aurochs*. See **BISON**.

BONAVENTURA, *bo-nā-vēn-tō'rā*, SAINT (real name John of Fidanza): 1221-74, July 15; b. Bagnorea, Tuscany: one of the most eminent Rom. Cath. theologians. In 1248, he became a Franciscan monk; in 1253, a theological teacher at Paris, where he had studied; and in 1256, general of his order, which he governed strictly but affectionately. The influence of his character now began to penetrate the church; and it was mainly through his eloquent persuasion that the differences which had sprung up among the cardinals on the death of Clement IV., 1268, were reconciled, and all induced to unite in electing to the papal dignity Tedaldus Visconti (Gregory X.). The new pope created B. Bishop of Albano, and cardinal, 1273, when he accompanied Gregory to the Council of Lyon, where he died

BONAVISTA—BONCHAMP.

from sheer ascetic exhaustion. He was honored with a splendid funeral, which was attended by the pope, the king, and all the cardinals.

On account of his unspotted character from earliest youth, as well as the miracles ascribed to him, he received, even during his life, especial veneration. Dante, who wrote shortly afterward, places him among the saints of his Paradiso in 1482, he was formally canonized by Sixtus IV.; and in 1587, was ranked by Sixtus V. as the sixth of the great doctors of the church. The religious fervor of his style procured for him the title of *Doctor Seraphicus*, and his own order are as proud of him as the Dominicans are of Thomas Aquinas. A great part of his writings is devoted to the praise of his order, and to the defense of Mariolatry, celibacy, transubstantiation, communion in one kind, and other doctrines and practices of the middle ages, which he attempts to deal with in a philosophical manner. His most important works, the *Breviloquium* and *Centiloquium*, are properly text-books on dogmatics. Unfortunately, his efforts to philosophize the church creed, and that deep mysticism in which his spirit revelled, make him often obscure and unintelligible even in his most popular treatises. With B., theology is the goal of all art and science; and in his *Itinerarium Mentis in Deum*, as also in his *Reductio Artium in Theologiam*, he represents union with God, to which the soul attains through six stages, as the highest good. He did more than any other of the early theologians to give scientific form to the mystical theology. His *Biblia Pauperum*, or 'Poor Man's Bible,' is a mystico-allegoric explanation of the plain contents of the sacred books for the benefit of the laity. In warmth of religious feeling, however, and in the practical tendency of his ethics, he far excels the hair-splitting scholastics. In his commentary on the *Sententiæ* of Peter the Lombard, he acutely argued against the eternity of the world, and also advanced some original proofs of the immortality of the soul. The most complete edition of his works appeared at Rome (8 vols. 1588-96).

BONAVISTA, *bôn-a-vîs'ta*: bay and cape on the e. coast of Newfoundland, lat. 48° 42' n., long. 53° 8' w.

BONBON, n. *bông'bông'* [F.]: a sweetmeat; a sugar-plum.

BONCHAMP, *bông-shông'*, CHARLES MELCHIOR ARTHUR, Marquis DE: 1760, May 10—1793, Oct. 17; b. Jouverdeil, in the old province of Anjou: a leader of the Vendean party in the civil war consequent upon the French revolution. He took part, like many young French officers, in the American war of liberation; and when he returned to France, was made captain. Of strong royalist principles, he looked with disfavor on the revolution. After living some eighteen months in solitude, he allowed himself to be chosen leader of the Anjou insurgents. The army of La Vendée would have been more formidable if B.'s tactics had been adopted, but this was not done until it was too late. In

BOND.

the sanguinary encounter at Chollet, 1793, Oct. 17, B. received a fatal shot in the breast, and when his followers vowed to revenge his death on 5,000 republican prisoners, the dying hero exclaimed: 'Spare your prisoners. I command it.' This last command was obeyed.

BOND, n. *bōnd* [AS. *bindan*, to bind; *bonda*, a boor, a householder: Icel. *bondi*, a husbandman: Ger. *band*, a string. old Dut. *bond*, a tie] anything that binds, as a rope, a chain, etc.; union; an obligation; a vow or promise; a written agreement; in *masonry*, the connection established among the stones or bricks in a wall, by a certain disposal of some of them: see BRICK-LAYING: V. to place in government storehouses; to secure; to give bond for. BOND'ING, imp.: ADJ. putting in a government warehouse, as duty unpaid goods. BOND'ED, pp: ADJ. applied to goods left in bond-stores. BONDS, n. plu. *bōndz*. chains; imprisonment; in *carp.*, all the timbers disposed in the wall of a house; also called *bond-timber*. BOND-STORES, or BONDED STORES, *-stōrz*, government warehouses where goods are stored until such time as the duty has been paid. BOND, a. in a state of servitude or slavery; bound—as BONDMAN, BONDMAID, BOND SERVANT, BOND-SERVICE, BOND SLAVE. BONDAGE, v. *bōn'dāj* [OF. *bondage*—from mid. L. *bondā-gium*, a low kind of tenure]: slavery; servitude of a grinding description; imprisonment. BONDSMAN, n. *bōndz'mān*, a slave; a surety. IN BOND, in government warehouse till the duty be paid. BONDFOLK, n. men, women, and children collectively in bondage or slavery.—SYN. of 'bonds' and 'bondage': chains; fetters; captivity; imprisonment; incarceration; confinement; slavery; servitude; immuring; thralldom.

BOND, in Law: an instrument written and signed (it should also be sealed), by which the party granting it becomes bound to pay a sum of money, or perform any act or duty, according to the terms of agreement. The person thus bound is called the obligor, and he to whom the B. is given, the obligee; and this obligation may be either by or to one or several persons. The B. may be unconditional or simple, merely for the payment of money, or it may be conditional, the performance of which is secured by a penalty; but in any event, the debt created by a B. is of the high nature of a *Specialty Debt* (q.v.).

As a B. is an acknowledgment of debt under seal, it is also called a specialty, since the debt is particularly specified in it; and being of a higher order than a contract without a seal, its acceptance for a simple debt will change the debt into the higher security. The requisites of a good B. are as follows: 1. There must be an obligor and an obligee. As to the question who may be parties to a B., it may be remarked, that in general no one who is under any legal disability to contract can become an obligor, though he may become an obligee. The B. of a married woman will bind neither her nor her husband. So an infant cannot bind himself unless the B. be given for the amount of necessities, and in that case it must be for the exact amount

BOND.

due; for if there be a condition for the payment of interest or other penalty, the whole security will be void. Nor will a minor's confirmation after he has attained majority always make a B. valid that was originally void. A B. is good though it be given to an infant, a lunatic, an idiot, or an alien. 2. The obligor must be bound in a specified sum; for if no sum be mentioned, the B. is void; but an error made in expressing the sum may be corrected by the courts, if the intention of the parties can be collected from other portions of the agreement. Thus, if the obligor is bound for 1,000, without any denomination of money being mentioned, and the rest of the agreement shows clearly that dollars were meant, the B. is nevertheless binding for the amount agreed upon by the parties. 3. The language used must clearly create an obligation. No particular form of expression is necessary to make a B. binding. It is sufficient if it be written in English and the intention of the parties be clearly expressed. 4. The instrument must be properly executed. Bonds like deeds take effect from the time of delivery, without reference to the dates they bear; and hence a B. will be binding though it bear an impossible or false date, or even if it bear no date at all. See MORTGAGE: BROUAGE: BONDS TO PROCURE MARRIAGE: SPECIALTY DEBT.

BOND. of Corporations, and of Government: a legal instrument binding to a certain payment or action. The power to execute and issue bonds, etc., belongs to all corporations, and for this they hold a common seal. When in a bond the name of the payee is left blank, the lawful holder may sign his name as such. The U. S. supreme court decided that, in general, coupon bonds issued by corporations, drawn payable to bearer, and apparently intended to pass from hand to hand, are to be regarded and treated as negotiable instruments. Coupon bonds of the ordinary kind, payable to bearer, pass by delivery; and purchasing of them, in good faith, is unaffected by want of title in the vender. The burden of proof on a question of faith lies on the party who assails such possession. In some states, detached coupons are transferable by delivery, and the holder may sue in his own name; in other states, the courts have decided that coupons disconnected from the bond with which they were issued are not negotiable without a legislative enactment to that effect. Coupons of bonds issued by public officers are valid when signed by a printed *fac-simile* of the maker's autograph adopted for that purpose, even if such signing is not expressly authorized by statute. As a rule, coupons bear interest from the time of a demand of payment after their maturity. A railroad company issuing bonds by authority of legislature, and stipulating to pay a higher rate of interest than the legal one, must continue to pay that higher rate if the bonds are not paid when they become due. Bonds that have been executed and placed for sale in the hands of an agent do not, while yet on sale, constitute *property* subject to seizure, under an attachment against such corporation.

There is a wide difference between bonds issued by a

BOND—BONDI.

governmental organization, and an individual promissory note. The governmental bonds are commercial securities, and are similar to currency. Payment made in negotiable bonds for property bought by a city is the same as if currency had been used in the transaction, if the terms and circumstances of the contract imply that intention; and such manner of payment implies that the vender intended no reservation of lien or privilege to secure the bonds at maturity. The U. S. government issued between 1861 and 1876 (15 years) bonds and treasury notes to the amount of \$5,011,818,908. The coupon and registered bonds issued in 1862, '64, and '65, redeemable after 5 and payable after 20 years, are known as five-twenties of 1862, '64 and '65, respectively. Other issues are known as ten-forties of 1864; sixes (bearing 6 per cent interest) of 1881; seven-thirties (bearing 7·3 per cent interest), etc. See UNITED STATES MONEY.

BOND, WILLIAM CRANCH: 1789–1859; b. Portland, Me.: astronomer. He was a watchmaker, when an eclipse, in 1803, led him to a study of astronomy. He continued at his trade; but gave much of his time to study, and secured a private observatory at Dorchester (now a part of Boston), where his discoveries attracted attention. He was one of the first American observers to note the comet of 1811. In 1815 he was sent to Europe, with a commission in reference to a proposed observatory for Harvard University. In 1838, he was appointed by the U. S. govt. to accompany Wilkes's exploring expedition to the South Sea, and make astronomical and meteorological observations. The next year he superintended the building of the Harvard observatory, and became its director (1840). He was one of the first to apply photography to celestial phenomena.—His son, **GEORGE PHILLIPS B.** (1825–1865, Feb.; b. Dorchester) graduated at Harvard 1845, and succeeded his father as prof. of astronomy and director of the observatory 1859. His treatise on the Rings of Saturn and other works gave him wide repute.

BONDAGER, *bōnd'āj-ēr*: in Scotland, a rural laborer, man or woman, who rents a cottage from a farmer under an obligation to work for him at current wages at certain seasons.

BOND CREDITOR: term sometimes applied to a creditor whose debt is secured by a bond, and therefore privileged as a specialty: see **BOND**, in Law.

BONDED WAREHOUSE: see **WAREHOUSING SYSTEM**.

BONDER, n. *bōnd'ēr* (generally plural, **BONDERS**), or **BOND-STONE:** in *masonry*, stones which reach a considerable distance into, or entirely through, a wall, for the purpose of binding it together.

BÖNDER: in Norway and Sweden, a class of land-owners or farmers corresponding in some respects to the barons and burgesses in England. Under the ancient rulers they were very powerful, and often forced important concessions from their kings.

BONDI, *bon'dē*, **CLEMENTE:** 1742–1821; b. Mizzano, Parma: Italian poet. He was educated by the Jesuits; and when still very young, appointed to deliver lectures in rhetoric, in

BONDOU—BONDY.

the Royal Convent at Parma. Here he produced his first work, *Giornata Villereccia* (Parma, 1773). After fleeing from a priestly persecution, he found a patron in the Austrian Archduke Ferdinand, and fixed his residence in Vienna, where he died. His poems are lyrical, descriptive, satirical, and elegiac. They please persons of culture and delicate sensibilities by the light-flowing elegance of their versification, and the rare purity of their style. Among his larger works are *La Conversazione*, *La Felicità*, and *Il Governo Pacifico*. Italians consider B.'s translation of the *Æneid* to possess remarkable excellence. His entire works were published at Vienna, 1808.

BONDOU, or BONDU, *bon-dô'*: a former kingdom in Senegal, West Africa, now a French protectorate. The soil is fertile, producing cotton, indigo, millet, maize, tobacco, etc. The weaving of cotton cloth, which, besides being made up into articles of dress, is used as currency, forms part of the industry of the people. The surface of B. is level, with elevations in the north and central parts the climate generally healthful, and vegetation luxuriant alike in field and forest. Iron is said to be plentiful, though not much worked, and the gold is obtained in small quantity. Wild animals are numerous; and the principal river on the e. border of the country, the Falemé, abounds with crocodiles. The inhabitants of B. profess Mohammedanism, trust greatly in sorcerers, and are chiefly of the Fulah tribe. B. exports cattle, corn, and gums; and has a transit trade in slaves, gold-dust, iron, salt, and butter. Pop. estimated 1,500,000.

The capital, Bulibani, is in a plain bounded by rocky hills and forests, on the left bank of the Falemé. Its streets are unpaved and dirty, and its buildings mean and miserable; mud-walls surround it, and in its centre is the extensive but rude palace of the sovereign. Pop. about 2,200, composed in great part of slaves, from the sale of which the ruler formerly derived considerable revenue.

BONDY, *bông-dê'*: town of France, dept. of the Seine, 7 m. e.n.e. of Paris, on the Ourcq canal. It has many country residences, but is noted particularly for its great forest, which covers about 5,000 acres, and was, so it is claimed, the scene of the assassination of Childeric II., King of Austrasia, by Bodillon, 673; and also of the murder of Aubry de Montdidier. These crimes, and several others, had given B. a sad celebrity, which it has happily lost; and it is now for the Parisians one of the most charming retreats. During the siege of Paris, 1870-71, B. was the scene of several terrible conflicts between the French and the Germans. Pop. (1891) 3,004.

BONE.

BONE, *n.* *bōn* [AS. *ban*; Ger. *bein*; Iccl. *bein*, the bone of the leg: Dut. *been*; W. *bon*, a stem or base, the legs being the stems or supports of the body]: one of the stems or supports of the body; the firm hard substance that composes the framework or skeleton of vertebrate animals; any part of the skeleton: **ADJ.** made of bone: **V.** to take out bones; to stiffen with whalebone. **BONES**, *n.* plu. *bōnz*, bobbins of bone for lace-making. **BONING**, *imp.*, sometimes spelled **BONEING**: **N.** taking bones out of meat. **BONED**, *bōnd*, *pp.*: **ADJ.** having large bones; strong. **BONELESS**, *a.* *-l's*, without bones. **BONY**, *a.* *bō'nī*, full of bones; stout; strong; consisting of bone; hard and brittle. **BONE-ASH**, the impure phosphate of lime obtained by burning bones. **BONE-BLACK**, charred bones. **BONE-BROWN** or **IVORY-BROWN**, bone and ivory roasted till they become of a brown color throughout. **BONE-DUST**, ground bones. **BONE EARTH**, the earthy or mineral part of bones, consisting chiefly of phosphate of lime. **BONE-ACHE**, pain in the bones. **BONE BED**, thin strata or layers found in several places in the earth's crust, so called from their containing innumerable fragments of fossil bones, scales, teeth, coprolites, etc. **BONE-BRECCIA**, an admixture of fragments of limestone and bones cemented together into a hard rock by a reddish calcareous concretion. **BONE-LACE**, flaxen lace. **BONE-SPAVIN**, a hard swelling on the inside of the hough of a horse's leg. **BODY AND BONES**, altogether; wholly. **BONE-SETTER**, one who is skilled in the setting of broken bones; an unqualified surgeon. **BONE SETTING**, the restoration of a broken bone to its proper place. **TO MAKE NO BONES OF**, to have no scruples about the thing; to swallow it easily. **BONE OF CONTENTION**, a subject provocative of wranglings and ill will—alluding to two dogs fighting for a bone. **BONE TO PICK**, a thing to divert or occupy attention; a cause of friendly fault-finding or censure; an unpleasant matter to settle.

BONE: the hard material of the skeletons or frameworks of mammalian animals, reptiles, and birds. In its earliest stages, it is termed temporary cartilage (q.v.) and consists of cells massed together, except in the flat bones, as those of the skull and shoulder-blade, of which the primary foundations are to a great extent of fibrous tissue. Points or centres of ossification form, the cells alter their form and arrangement, and a deposit of earthy materials, phosphate and carbonate of lime, takes place, rendering the former flexible substance rigid. By soaking a B. in a dilute mineral acid, we can dissolve these earthy matters, and render it again flexible; on the other hand, if we expose it to intense heat, the animal matter (gelatine) is got rid of, and though the bone retains at first its form, the slightest touch will cause its now unsupported earthy matter to crumble away. In the ill-nourished children of large towns are seen examples of the necessity of a proper relation of these two elements of B. to each other; in the disease called rickets, the earthy matter is deficient, and the too flexible leg-bones bend under the weight of the trunk. In the aged person the B. substance becomes more densely packed with earthy

BONE.

matter, and becomes brittle, rendering them peculiarly liable to fractures.

The bones of the skeleton are classified according to their shapes—viz., as long bones, e.g., the thigh-bone and arm; bone; flat bones, as the shoulder-blade and skull-bones; short and irregular bones, as those of the wrist or the vertebræ. The substance of bones is arranged differently in different parts—either hard and close, which is called the condensed substance, or loose and reticulated, called the cancellated structure. *Long Bones* have a shaft of hard substance terminating at each end in soft or cancellated structure; in the latter situations, the B. is more expanded, and rounded off to enter into the formation of a joint. *Irregular Bones* consist of a shell of condensed tissue, inclosing a mass of cancellated structure, and are smoothed off into surfaces adapted to those of the adjoining bones. *Flat Bones* consist of two layers of hard tissue, with an intermediate cancellated structure. Anatomists also talk of *mixed* bones, those which are both long and flat, as the ribs, the breast-bone, and the lower jaw.



Transverse Section of Bone,
Showing its microscopic structure.

The shaft of a long B. is hollow, and filled with an oily substance, the marrow (q.v.); the space in which the marrow lies is called the medullary canal. This fatty substance is found also in the cancellated structure of short and mixed, and in the diploë of flat bones, and even in the condensed tissue. Bones are covered externally by periosteum (q.v.), and on the surfaces of the cavities within by a fine membrane called internal periosteum or medullary membrane. B. is largely supplied with blood-vessels, which are continued into it from those of the periosteum; the largest are those which enter the cancellated ends of the long bones. The medullary membrane receives a special artery for the supply of the compact tissue next the canal. This vessel enters the bone generally rather above its middle, and divides into two branches, one of which runs up, the other downwards, both dividing into numerous branches, anastomosing with the vessels we have alluded to as entering the cancellated tissue. After the

BONE.

arteries enter the compact tissue of bones, they run in small capillary canals, invisible to the naked eye, which permeate the bone, and anastomose, leaving oblong loops or meshes. The veins of B. also are contained in these canals, but they are larger than the arteries, and have at irregular intervals, where branches meet, dilatations or reservoirs for the blood.

These canals, named Haversian, after their discoverer, Clopton Havers, an old English anatomist, vary in diameter from $\frac{1}{2500}$ to $\frac{1}{200}$ of an inch. They take a longitudinal direction, and if a transverse section is examined under the microscope, it appears pierced with holes, which are the Haversian canals cut across. Each canal is surrounded by its own layers of condensed structure, forming in the aggregate a hollow rod or pin, called the Haversian system, running through the plates of which the B. is composed, and securing their cohesion. In addition to these, there are to be seen a number of minute spaces or *lacunæ*, generally oval in man; from these pass numerous pores or *canaliculi*, which are directed to the nearest vessels: those in the periosteal, or outer, lamella pass into the B. from orifices on its surface, and the *lacunæ* face outward. The pores of the internal layer open on the medullary canal, and its *lacunæ* face toward it, and the *lacunæ* in the layers around each Haversian canal face toward, and their pores open into, it.

Nerves, may be seen entering B., and the acute pain felt in some of its diseased conditions prove their existence, but they have not yet been actually demonstrated in the osseous tissue; neither have *absorbents*, though from analogy it is supposed bones are supplied with them.

For the several bones composing the animal frame, see SKELETON: for important peculiarities in the bones of different classes of animals, see those classes.

Chemical Composition of Bone.—The principal chemical ingredients present in B. are gelatine and phosphate of lime; and the following table represents the composition in 100 parts of B. of average quality:

	Human Bones.	Ox Bones.
Gelatine.....	33·30	33·30
Phosphate of Lime.....	53·04	57·35
Carbonate of Lime.....	11·30	3·85
Phosphate of Magnesia.....	1·16	2·05
Soda and Chloride of Sodium (common salt).....	1·20	3·45
	<hr/> 100·00	<hr/> 100·00

When a B. is digested in dilute hydrochloric acid at a summer heat, the earthy matters are gradually dissolved out, leaving the gelatine of the size and shape of the original B., but now soft, somewhat transparent, flexible, and even elastic. If this soft gelatinous residue of B. be boiled with water, it dissolves in great part therein, and yields a solution which *sets* or gelatinizes on cooling. A more common way of extracting the gelatine from B. is to heat the bones covered with water in a digester to a temperature of 270°–280° F., when much of the gelatine dissolves out, and

BONE.

leaves the earthy salts with the remainder of the gelatine. Besides the marrow (q.v.), a little fat is generally found permeating the entire structure of the B., which can be extracted by throwing the bones into hot water, when the grease or fat exudes and floats to the surface. In some of the larger bones of man and other mammalia, there is a central cavity containing a considerable amount of fatty matter, popularly known as *marrow*. These cavities are not found in the bones of the young animal, but gradually form as the animal approaches maturity. In the sloth, cetacea, seals, and a few other animals, the cavities are not found. Occasionally, as in man, the elephant, giraffe, etc., the bones in the head have cavities filled with air instead of marrow. The uses of bones of animals, for food, are various. In the cooking of soups, bones form a constant ingredient, supplying gelatine, which gives a *body* to the soup. Where the soup is required of great lightness, for an invalid with weak digestive powers, the shavings of stag's horns may be employed, and these yield a *hartshorn jelly* free from oil, which therefore sits lightly upon the stomach. How far gelatine is of itself nutritious, is a question: see GELATINE and NUTRITION. Animals, however, like the dog, which masticate, devour, and digest the entire B., do derive benefit therefrom, in part from the gelatine, and in other part from the earthy substances; and the same remark applies to the use sometimes made of small fish, where, after being thoroughly browned, they are entirely eaten. In times of scarcity in Norway and Sweden, the poorer people eat the bones of mackerel and other fish.

B. is largely used in making the handles of small brushes, the more common table-knives and forks, and penknives, and in manufacture of the cheaper sort of combs (q.v.). Our forefathers, before the metals were known, fashioned fish-hooks out of B., and used the spines in the tail and back-fin of certain fishes for pointing arrows. These uses of B., coupled with the employment of the serrated teeth of sharks as a war-weapon, are still practiced by many uncivilized tribes. The fatty and other organic matters in B. allow of its being employed as a fuel where coal or wood cannot be obtained, as in the pampas of South America and the steppes of Tataria. In these regions, it is considered that the heat evolved in the combustion of the bones of an ox suffices to cook the flesh.

B. is serviceable likewise in the arts in yielding Bone-ash (q.v.), Bone-black (q.v.), Bone-meal (q.v.), and by the addition of sulphuric acid, Superphosphate of Lime (q.v.), Phosphorus (q.v.), also certain oils and fats (see DIPPEL'S ANIMAL OIL) which are employed in forming Lamp-black (q.v.) and in the manufacture of Soap (q.v.) See also BONES AS MANURE.

BONE, HENRY, R.A.: 1755-1834: b. Truro, Cornwall: English enamel-painter. Apprenticed to a china manufacturer in Bristol, he removed to London, 1779, where he was employed in enamel-painting for lockets, brooches, etc. An enamel-portrait of his wife, exhibited at the Royal Academy,

BONE-ASH—BONE-BLACK.

1780 first attracted public attention; and he soon obtained a position which rendered it no longer necessary for him to continue his drudgery for the jewellers. In 1800, he was appointed enamel painter to the Prince of Wales, a position which he retained when the prince became king; and he also stood in a similar relation to George III. and William IV. The Royal Acad. made him an Associate, 1801, and a full Academician ten years later. Between this time and 1831, when advancing years compelled him to desist from his labors, he produced a large series of works remarkable alike for their beauty and dimensions; in the latter quality they were unapproached by any former or contemporary artist. The principal are *Bacchus and Ariadne* after Titian, sold for 2,200 guineas, and now in the national gallery; the *Death of Dido*; *Hope Nursing Love*, after Sir J. Reynolds; *Venus*, etc. He also executed a large number of historical portraits of great merit; and altogether his name is one of the highest, if not the highest in his profession.

BONE-ASH, or **BONE-EARTH**: obtained by the complete combustion of bones in an open furnace, when the oxygen of the air burns away the organic matter or gelatine, and leaves the earthy constituents as a white friable mass, the size of the original bone, but readily reducible to the condition of coarse powder, which is bone-ash. A very large quantity of B. is exported from S. America to other countries. The used bone-black of the sugar-refiner also is employed as a source of B., by being heated in a furnace exposed to the air. B. of good quality contains about 80 per cent. of phosphate of lime, and 20 per cent. of carbonate of lime, phosphate of magnesia, soda, and chloride of sodium (common salt); but it is found occasionally mixed with sand, especially as procured from S. America. B. is employed to some extent as a source of phosphorus (q.v.), and in the making of cupels (q.v) for the process of assaying (q.v.); but the most extensive use is in the manufacture of artificial manures, See **SUPERPHOSPHATE OF LIME**.

BONE-BLACK, or **ANIMAL CHARCOAL**, or **IVORY-BLACK**: prepared from bones by heating them in close retorts till they undergo the process of destructive distillation, when combustible gases and water, together with the vapors of various salts of ammonia, and oil, are given off, and B. is left in the retort. It is generally reduced to coarse grains from about the size of small peas, down to large pinheads, and is extensively used in the arts for decolorizing liquids, such as the syrup of sugar, and solutions of argol (impure cream of tartar) and of the alkaloids, as also in filters (q.v.), for separating chemical impurities from water. The general mode of using the B. is to allow the colored liquid to percolate through a layer of the charcoal when all color is arrested, and the syrup or water runs clear and colorless from under the stratum of charcoal. This power of absorbing coloring matters is also observable in vegetable (peat or wood) charcoal, but not to such extent as in bone-black. The application of heat to the liquids

BONE CAVES—BONE-MANURE.

before filtration greatly facilitates the decolorization, and where the volume of liquid to be operated upon is not great, the most expeditious method is to boil the liquid and B. together, and then strain through filtering-paper or cloth. The composition of B. in 100 parts is 10 of pure charcoal, associated with 90 of earthy salts—that is, in the proportion of 1 of pure charcoal in 10 of the commercial bone-black. The power of absorbing colors appears due to the porosity of the substance, and is not resident simply in the pure charcoal; indeed, the earthy matters (principally phosphate of lime and carbonate of lime) can be dissolved out of the B. by dilute hydrochloric acid, and the pure charcoal thus obtained possesses only about one-third the decolorizing power of the total amount of B. which it was obtained from. Thus if 100 parts of ordinary B. have the power of arresting the color from *ten* volumes of a given colored liquid, then the 10 parts of pure charcoal which can be obtained from the 100 parts of B. will be found to decolorize only *three* volumes of the same colored liquid; whence it appears that the earthy matters in the B. influence and increase the absorption of the coloring matter, and thus render a given weight of the charcoal of greater commercial value. When syrup of sugar and other liquids have been run through B. for some time, the pores of the latter appear to get clogged with the color, and the clarifying influence ceases, and then the B. requires to undergo the process of *revivification*, which consists in reheating it carefully in ovens, or iron pipes inclosed in a furnace, when the absorbed color is charred, and the B. can be of service again as an arrester of color. After several re-burnings the B. loses its absorptive capacity, and is then used for the manufacture of Bone-ash and Superphosphate of Lime (q.v.) B. has likewise a great power of absorbing odors, especially those of a disagreeable nature, and can thus be employed to deodorize apartments, clothing, outhouses, etc., or wherever animal matter may be passing into a state of active putrefaction.

BONE CAVES: see CAVES.

BONE-EARTH: see BONE-ASH.

BONE-GELATINE: see GELATINE.

BONE-MEAL; known also as Ground Bone, Bone-flour, and Bone-dust: bone reduced to fineness by crushing and grinding. It is used as a fertilizer, either directly or, after the addition of sulphuric acid, as dissolved bone (see BONES as manure), or Superphosphate of Lime (q.v.). To facilitate the process of grinding, some manufacturers steam the bones. This reduces the quantity of nitrogen, but the loss is offset by the elimination of fatty matters which would tend to prevent decomposition of the B. in the soil. The gelatinous substances are useful for the manufacture of glue, and, with the fat, nearly or quite pay the expense of steaming. B. from steamed bones contains about 3 per cent. of nitrogen and 20 per cent. of phosphoric acid. It is of special value on moist soils and for root crops.

BONER—BONES.

BONER, *bō'nér*, **ULRICH**. one of the oldest German fabulists; a preaching friar of Bern, frequently mentioned in documents of 1324–49, at the period when the minnesingers and poets of chivalry had passed away. His collection of 100 fables, or 'examples,' as they used to be called, was entitled *Der Edelstein* (The Precious Stone), printed first at Bamberg, 1461. It is marked by purity of style, and by clear and vivid delineation. This book is one of the greatest of all bibliographical rarities; only one copy—that in the Wolfenbüttel Library—is known. It is decorated with wood-cuts. Bodmer and Breitinger published a complete edition of the work, Zürich, 1757.

BONES AS MANURE: valuable adjunct in modern agriculture. They are applied either simply reduced to small fragments or a coarse powder called *Bone-meal* (q.v.), or, after undergoing chemical preparations of various kinds, as the basis of highly valuable artificial manures: see **BONE-ASH**: **SUPERPHOSPHATE OF LIME**. Most of the substances of which they are composed are useful to crops, but it is their large proportion of phosphates which makes bones specially valuable for fertilizing purposes. Phosphoric acid, of which bones contain more than 20 per cent. of their weight, forms part of the structure of all animals and plants, and is indispensable to their life and growth. Though diffused through all soils, it is found only in small proportions and in comparatively insoluble forms. Unless liberal quantities of manure or fertilizer have been applied, land that has been long under cultivation is usually deficient in this element; and on grain and dairy farms, it often becomes so sparse as greatly to reduce the yield of crops in the cultivated fields, and seriously injure the pastures. The application of properly prepared bones to soils from which the stores of phosphoric acid have been drawn in too large measure by injudicious cropping or feeding, often causes great and immediate improvement. By the same means the yield of certain crops, e.g., turnips, cotton, and sugar-cane, which need large proportions of phosphoric acid, may be largely increased in soils which already contain a fair proportion of this element. B. usually give the best results as fertilizers when applied on rather moist soils; but on any kind of land, the readiness with which they act will be largely determined by the degree of fineness to which they have been reduced. If used whole or in coarse pieces, it will be several years before much of the plant-food which they contain will become available for the use of crops; and even when finely ground, both their phosphoric acid and their nitrogen (which forms 3 to 6 per cent. of their weight) are yielded rather slowly to plants. For this reason, B. are more useful for trees and for crops which have a comparatively long period of growth than for spring grains and other crops which are in the ground only a short time. But in order to make them really profitable as fertilizers, B. should in some way be thoroughly pulverized. Where there are no facilities for grinding B., which work requires

strong machinery and involves considerable expense, other methods of reducing them to fineness are sometimes employed: among these are breaking into small pieces and then fermenting them by packing in heaps of earth moistened frequently with water or urine; or by packing the pieces in fresh horse-manure, or with wood ashes kept moist by frequent turning on of water; or by packing the pieces with quicklime and ashes, and by using a solution of potash. The time required to fit B. for use by these processes varies from a few weeks to several months, according to the degree of fineness to which the bones are broken and the rapidity of the fermentation; the latter largely depending on the kind and strength of the materials employed. By any of these methods, also in the manufacture of Superphosphate of Lime (q.v.), there is some loss of nitrogen which the B. contained, but this is much more than offset by the greatly-increased availability of the remaining nitrogen and of the phosphoric acid. In manufacture of certain commercial fertilizers (see FERTILIZERS) ground bone, bone-ash, or spent bone-black is treated with dilute sulphuric acid. The resultant product is a valuable fertilizer, sometimes called dissolved bone, but in the United States known generally as superphosphate.

BONESET: see EUPATORIUM (THOROUGHWORT).

BONET, *bo'nēt*, JOHN PAUL: 17th c.: a Spaniard, one of the first instructors of deaf mutes. Only one person before him had been at all successful in the art, and B. does not appear to have known of him; so that B. is really entitled to the claim of originality in his method, which consisted in imparting instruction by the sight instead of by the ear—gestures, writing, a manual alphabet, and an artificial pronunciation, being the means employed. His plan is minutely detailed in his vol. *Reduccion de las Lettras, y Arte para enseñar a hablar los Mudos*, Madrid, 1620. The manual alphabet now in use at almost all deaf and dumb institutions in Europe and America, differs little from that introduced by Bonet.

BONFIRE, n. *bōn'fīr* [Dan. *baun*, a beacon, and *fire*]: a beacon-fire; a large fire made in the open air as a sign of rejoicing, or for display. The practice of kindling fires of this kind is of so great antiquity in England, Ireland, and Scotland, as to be traced to pagan rites: see BELTEIN. It was customary to kindle one of these fires in token of rejoicing on Midsummer Eve—the evening before June 24, which day was appropriated by the church for the feast of St. John the Baptist. Reference is made to bonfires on this occasion by Googe in his translation of the poet Naogeorgus:

Then doth the joyfull feast of John the Baptist take his turne,
When bonfiers great, with loftie flame, in everie towne doe burne;
And young men round about with maides doe dance in everie
streete,
With garlands wrought of motherwort, or else with vervain
sweete, etc.

BONGAR—BONGO.

For much antiquarian lore on this subject, see Brand's *Popular Antiquities*, edited by Sir Henry Ellis, vol. i. The origin of the word B. has been very puzzling to etymologists. In Scotland, the popular term is *bunefire* or *bainfire*, which Jamieson says is apparently a corruption of *bailfire*, or of *baal-fire*, which may be doubted. Skeat holds the word was first used of the fires for burning the bones of saints and other relics in the time of Henry VIII. Another etymology is the Welsh *ban*, high, whence *ban-ffagl*, a lofty blaze, a bonfire. The hills that in English are called *Beacons*, are in Welsh *Bans* or *Vans*.

BONGAR, *bôn'gâr* (*Bungarus* or *Pseudoboa*): genus of venomous serpents, allied to the genera *Elaps* and *Naja*, and distinguished by a much keeled back, which has a row of hexagonal scales larger than the rest. The head is broad and depressed, with very strong bones. The species,



Bongar, or Rock Snake.

which appear to be few—only two being certainly known—are natives of the East Indies, where they are called Rock Snakes. *B. annularis*, which has the body surrounded with rings of black and yellow, attains a length of six or eight feet.

BONGAR'DIA: genus of herbaceous plants of the nat. ord. *Berberideæ* (q.v.), natives of the East. One species (*B. Rauwolfii*) produces tubers, which are eaten, either boiled or roasted, in Persia; and the leaves of another (*B. chrysogonum*) have an acid taste and are eaten as a salad.

BONGAY, *bon-gā'*: island of the East Indian archipelago, e. of Celebes. It gives name to a group of islets, which supplies the neighborhood with slaves and wood.

BON'GO: a barbarous people of central Africa inhabiting the territory between 6° and 8° n. lat., and 27° and 29° e. long., and watered by five important tributaries of the White Nile. The B. are a short-headed race, with black hair, of red-brown complexion, and medium height. Sorghum is the grain most generally cultivated by them. They eat all kinds of reptiles and birds; and of beasts, they refuse only the dog. They raise poultry, goats, and dogs; but sheep and cattle are rare. Tobacco is everywhere raised and smoked among them. They work iron with skill, using it as currency, and for spears, knives, rings, and other useful and ornamental purposes. They take great delight in songs and instrumental music,

BONHEUR—BONIFACE.

BONHEUR, *bon-ēr'*, ROSALIE (called ROSA): painter of animal life: b. Bordeaux, 1822, Mar. 22. She studied painting with her father; first exhibited in Paris 1841; has been director of the free school of design for girls in Paris since 1849; and has received decorations from the French, Spanish, and Belgian govts. Her most famous painting, *The Horse Fair* (1855), bought by A. T. Stewart, afterward by Cornelius Vanderbilt, is in the Metropolitan Museum of Art, New York. D. 1899, May 25.

BONHOMIE, n. *bŏn'-ŏm-ē'* [F.—from *bon*, good; *homme*, man]: good-nature; simplicity. **BON-MOT**, n. *bŏng-mō* [F. good word]: a witty saying or reply; a jest; a joke. **BONS-MOTS**, n. plu. *bŏng-mōz*. **BON-VIVANT**, n. *bŏng-vēv-āng'* [F. good living], a high feeder or liver. **BONS-VIVANTS**, n. plu. *bŏng-vēv-āngz'*, good companions.

BONI, *bō'nē*, or **Bo'NY**: a state on the s.w. peninsula of the island of Celebes, in the s. Pacific ocean; formerly the most powerful state in Celebes, but since 1859 practically a Dutch dependency. In the n., the scenery is fine, and the soil fertile—rice, sago, and cassia being produced. The inhabitants engage in agriculture and in the manufacture of cotton, and articles of gold and iron, in which they have a large trade. Their institutions, said to be very ancient, partake of the character of a constitutional monarchy. The British have twice attacked the Bonese for injuring their commerce, and selling the crews of British ships into slavery. In the second attack, 1814, the Bonese king was killed. Pop. 200,000.

BONI, or **BONY**, **GULF OF**: bay separating the s.e. and s.w. peninsulas of the island of Celebes. It is 200 m. long, and 40–80 m. broad. Numerous shoals render its navigation difficult.

BONIFACE, n. *bŏn'ŭ-fās* [L. *bŏnus*, good, pleasant; *fāciēs*, face, appearance]: in *familiar language*, a sleek, jolly, good-tempered landlord of an inn or tavern.

BONIFACE: name of nine popes, some of whom are of no historic note.

BONIFACE I: (reigned 418–422); appointed, contrary to canonical rule, by the Emperor Theodosius II., on account of prevailing party divisions. He was the first who assumed as Bp. of Rome the title of First Bp. of Christendom.

BONIFACE III.: pope for ten months in 607; the first to whom the title of Universal Bishop of Christendom was conceded by the Greek emperor (Phocas).

BONIFACE VIII. (previously Benedict Cajetan): native of Anagni; elected pope, 1294, Dec. 24. His inauguration was distinguished by great pomp; the kings of Hungary and Sicily held the reins of his horse as he proceeded to the Lateran, and, with their crowns upon their heads, served him at table. He failed, however, in his attempts to assert a feudal superiority over Sicily, and to exercise his papal authority in the disputes between France and England. Philip the Fair of France, supported by his states and clergy, maintained the independence of his kingdom, disregarding many bulls and briefs, and even the sentence of

BONIFACE.

excommunication to which the pope proceeded. Philip at last, with the aid of Italian enemies of B., made him prisoner at Anagni, to which he had fled; and although he was liberated by the people of Anagni after two days' imprisonment, he died within about a month (1303), (as some say) of grief and mortification; as others report, in consequence of having refused food during these two days, through fear of poison. He instituted the Roman jubilee in 1300. If the charges, which Philip the Fair brought against B. in self-defense—viz., heresy, simony, licentiousness, etc.—were well founded, and regarding the second there can be no doubt, Dante was not far from at least a poetic justice in giving him a place in hell. Apart from the question of his personal character, B. was undoubtedly one of those dangerous ecclesiastics in whose downfall civilization exults.

BONIFACE IX. (Peter Tomacelli): d. 1404: native of Naples, succeeded Urban VI. as pope at Rome 1389, while Clement VII. was pope at Avignon. He exceeded all his predecessors in the shameless sale of ecclesiastical offices and benefices, and of dispensations and indulgences. He acquired, after a struggle, a most despotic power in Rome, which he kept in awe by fortresses; but to secure himself against external enemies, particularly Louis of Anjou, whose claim to the crown of Naples he had opposed, he was obliged to give away part of his territory in fiefs, as Ferrara to the House of Este.

BONIFACE, *bôn'e-fîs*, SAINT, 'the Apostle of Germany,' (original name, Winfried): abt. 680–755; b. Devonshire, England. He entered a monastery in Exeter, at the age of 13; afterward removed to that of Nutcell, where he taught rhetoric, history, and theology, and became a priest at the age of 30. At that time, a movement proceeded from England and Ireland, for the conversion of the still heathen peoples of Europe; in 614, Gallus and Emmeran had been sent to Alemannia, Kilian (murdered 689) to Bavaria, Willibrord (died 696) to the country of the Franks, Swidvert to Friesland, and Siegfried to Sweden. Winfried also took the resolution (715) of preaching Christianity to the Frisians, among whom it had as yet found no entrance. But a war broke out between Charles Martel and the king of the Frisians, and Winfried returned from Utrecht to his convent, of which he became abbot. Still bent upon his design, he repaired to Rome, 718, and received the authorization of Pope Gregory II. to preach the gospel to all the tribes of Germany. He went first to Thuringia and Bavaria, then labored three years in Friesland, and travelled through Hesse and Saxony, everywhere baptizing multitudes, and consecrating their idolatrous groves as churches. In 723, Gregory II. called him to Rome; made him bishop, with the name of Bonifacius; furnished him with new instructions or canons, and with letters to Charles Martel and all princes and bishops, requesting their aid in his pious work. Returning to Hesse (724), he destroyed the objects of heathen worship (among which are mentioned on oak near Geismar, sacred to Thor, and an idol named

BONIFACIO—BONIN ISLANDS.

Stuſſo, on a ſummit of the Harz, ſtill called Stufenberg), founded churches and convents, and called to his aid prieſts, monks, and nuns from England, whom he diſtributed through the various countries. In recognition of his eminent ſervices, Gregory III. ſent him (732) the palium, and named him archbiſhop and primate of all Germany, with power to eſtabliſh biſhoprics wherever he ſaw fit. B. now made a third journey to Rome (738), and was appointed papal legate for Germany. The biſhoprics of Regensburg, Erfurt, Paderborn, Würzburg, Eichſtäd, Salzburg, and ſeveral others, owe their eſtabliſhment to St. B. The famous Abbey of Fulda is alſo one of his foundations. He was named Abp. of Mainz by Pipin, whom he conſecrated as king of the Franks at Soiſſons (752), and he preſided in the council held at that place. In 754 he reſumed anew his apoſtolic labors among the Friſians; and at Dokkum, about 18 m. n.e. of Leeuwarden, in Weſt Frieſland, this venerable Chriſtian hero was fallen upon by a mob of armed heathens, and killed, with the congregation of converts that were with him (755). His remains were taken firſt to Utrecht, then to Mainz, and finally to Fulda. In the abbey, there are ſtill ſhown a copy of the goſpels written by him, and a leaf ſtained with his blood. A collection of his letters, and the canons that he promulgated for the diſcipline of the newly eſtabliſhed churches, have been preſerved, and are inſtructive as to the ſtate of Germany at the time. The completeſt edition of the Letters (Epistolæ) is that of Würdtwein (Mainz, 1789). In 1811, a monument was erected to St. B. on a hill near Altenberga, in the principality of Gotha, where, according to tradition, he had erected (724) the firſt Chriſtian church in n. Germany. A ſtatue by Henſchel was alſo erected to him at Fulda, 1842. See works on B. by Seiters (1845), Werner (1875), Fiſcher (1881), and Ebrard (1882).

BONIFACIO, *bo-ne-fü'cho*, STRAIT OF: modern name of the ſtrait between Corsica and Sardinia, the *Fretum Gallicum* of the Romans. At the narroweſt part, it is only 7 m. wide. The navigation is difficult, owing to the great number of rocks, which, however, are favorable to the production of coral, and the coral and tunny fisheries are actively proſecuted. At the eaſtern entrance of the ſtrait lie the Bucinaric or Magdalen Iſlands, the *Insulæ Caniculariæ* of the ancients, principally inhabited by Corſicans, but belonging moſtly to Sardinia.

The ſtrait receives its name from the ſmall town of Bonifacio in Corsica, ſtrongly ſituated upon a rocky promontory, with an excellent harbor. It was a place of much conſequence to the Genoese for the ſecurity of their trade in theſe ſeas, and a number of very fine churches ſtill atteſt its former greatneſs. Pop. 3,300.

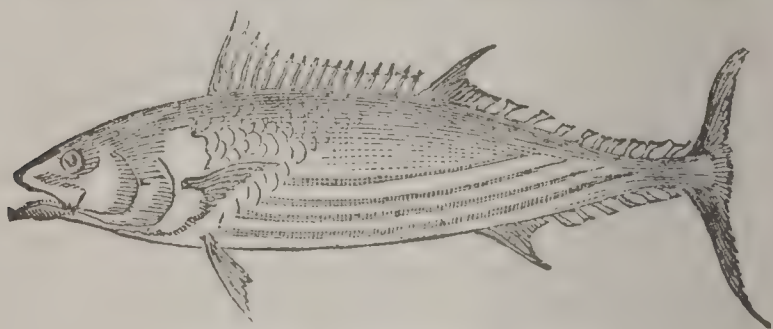
BONILLO, *bo-nēl'yo*: town of Spain, province of Albacete, 34 m. w.n.w. from Albacete. Pop. about 5,000.

BONIN, *bo-nēn'*, or ARCHBIſH'OP, ISL'ANDS: in the Pacific; in n. lat. between 26° 30'–27° 44', and in e. long. between 142°–143°. They were diſcovered 1827 by Captain

BONITO—BONN.

Beechey of the *Blossom*, who took formal possession of them for England. They appear to have been then uninhabited, though previously a Japanese colony. In 1830, however, Peel Island, near the centre of the group, was settled in connection with the whaling business, by a motley colony—an Englishman, an Italian a Dane, two Americans, and 15 Sandwich Islanders (5 men and 10 women)—under the auspices of a 'union jack': area 32½ sq. m.; pop. (1881) 151. Besides pigs, goats, and fowls, Peel Island produces sweet potatoes, maize, onions, yams, pumpkins, melons, lemons, tobacco, and sugar-cane. since 1876, the islands have belonged to Japan.

BONITO, *bō-nī-tō*, [Sp.]: name common to several fishes of the mackerel family, or *Scomberidae* (q.v.). One of these, *Gymnosarda palamis*, the Stripe-bellied 'Tunny', but of another genus than the Albacore or Great Tunny



Bonito, or Stripe-bellied Tunny.

(q.v.), is well known to sailors as an inhabitant of tropical seas, and as one of the fishes most frequently seen pursuing the flying-fish. It is often taken by an imitation flying-fish made to skim along and touch the waves. Its flesh, although relished by those who have been previously confined to salt provisions, is dry. It is rarely caught on the British coasts. It is a very beautiful fish, seldom exceeding thirty inches in length, of a beautiful steel-blue color, darker on the back, and whitish below. Four dark lines extend along each side of the belly. The general form resembles that of the mackerel, but less compressed.—The **B. of the Atlantic** (*Sarda sarda*) n. to Cape Cod, is very similar to this, but of an allied genus, distinguished by its comparatively large and strong teeth. It has dark transverse bars reaching obliquely forward, downward to the lateral line. It is plentiful in the Black Sea. The Plain B. (*Auxis thazard*), or Frigate Mackerel, may be distinguished at once from both of these by its more uniform blue color, without stripes or bands, and by the widely separated dorsal fins. It has only one row of minute teeth in each jaw. It is found in the Mediterranean, and in some places seems to bear, in common with the last-mentioned species, the name B. Its flesh is little esteemed when fresh; it is generally used either salted or pickled. It is occasional on our coast. The Little B. (*G. allaterrata*), rare at the n., has wavy dark streaks above the lateral line, and 5 spots below the pectoral fin; length 2½ feet.

BONN, *bōn*: town of Rhenish Prussia, beautifully situ-

BONNER.

ated on the left bank of the Rhine, 15 m. above Cologne. B. is connected with the right bank of the Rhine only by a ferry, and with Cologne by the railway as well as the river. The Cathedral Church is a fine specimen of the last period of the Romanesque style, and exhibits the transition to the Gothic already begun. B. has considerable manufactures of cotton goods, earthenware, vitriol, and soap. The scenery in the neighborhood is very romantic. B. is the seat of a number of learned associations and institutions. It was Beethoven's native place. The Leopoldine Acad. of Physical Science, founded at Vienna 1652, was transferred to B. 1818. B. obtained a university 1786, which, however, was suppressed during the sway of France, and the present univ. was founded 1818, receiving from government the former electoral palace and other buildings, with an annual revenue of nearly \$75,000. There are two theological faculties, the one Prot. and the other Rom. Cath. The univ. 1881, had 102 professors and lecturers, and 1,070 students; and among its professors have been numbered men of high distinction, as Niebuhr and A. W. Schlegel, Arndt, Welcker, Dahlmann, Hermes, and Simrock. Its clinical establishments are of unusual extent, and admirably arranged. It has a library of more than 250,000 vols., archæological and other collections, a botanic-garden, an observatory, an agricultural school, a riding-school, etc. B. derives its origin from *Bonna*, one of the castles erected by the Romans in Germany. It was long the residence of the electors of Cologne; it was taken from the French 1689 after a severe bombardment by the Elector Frederic III. of Brandenburg: and in 1703 it surrendered, after a siege, to the English and Dutch army under Marlborough. It returned again into the possession of the Elector of Cologne 1715, and in 1717 its fortifications were razed. It was acquired by France 1802, and assigned to Prussia 1814. Pop. (1890) inclusive of the military, 39,805.

BONNER, EDMUND, Bishop of London: born of obscure and doubtful parentage, about the end of the 15th c.; d. 1569. The reputation that he gained at Oxford by his knowledge of the canon law, recommended him to the notice of Wolsey, who promoted him to several offices in the church. After the fall of Wolsey, B. was active in the work of reformation, and received due promotion from Henry VIII. In 1533, he was deputed to appear before the pope at Marseille, to appeal for the excommunicated monarch to a general council. The violence of his threats on this occasion suggested to His Holiness the fitness of having him burned alive, or thrown into a caldron of melted lead, so that B. judged it prudent to leave Marseille without notice. In 1540, he was made bp. of London. The death of Henry cooled his Protestant zeal; and having given proofs of his lukewarmness in the cause of reformation, he was at length, 1549, committed to the Marshalsea, and deprived of his bishopric. The accession of Queen Mary restored him to office, and gave him the opportunity of revenge, which he took without delay or stint. As vicegerent and pres. of the

BONNER—BONNET.

convocation, he was the principal agent in that bloody persecution which has made the reign of Mary infamous. On the accession of Elizabeth, 1558, B. accompanied his episcopal brethren to salute her at Highgate, but was excepted from the honor of kissing her hand. In 1559, May, he was summoned before the privy council, and refused, with noticeable consistency to take the oath of supremacy. He was accordingly deposed from his bishopric, and shut up in the Marshalsea, where he died. His cruelties were many and detestable; but he dealt strictly with the lax morality of his clergy; and he bore his final misfortunes with manly resignation.

BONNER, *bôn'ér*, ROBERT: publisher: 1824, Apr. 28—1899, July 6; b. Londonderry, Ireland. Having emigrated to the United States, he learned the trade of a printer, and was employed on the Hartford (Conn.) *Courant* 1839. Five years later he settled in New York, bought an insignificant paper called the *Ledger* 1851, and made of it a literary institution flourishing to this day, and bringing to its owner a great fortune. Thus he accomplished by making it a literary weekly of good tone and obtaining for it as writers some of the best-known authors, including Edward Everett, Henry Ward Beecher, and many others.

BONNET, n. *bôn'nèt* [F. *bonnet*; Gael. *boineid*, a head-dress: Ir. *boinead*, a cap—from *beann*, the top; *eide*, dress]: a cap or covering for the head of man or woman; a covering for the head worn by women; in *Scot.*, a round, worsted cap, formerly much worn by men; in *slang*, a pretended successful gambler, or a fictitious bidder at an auction, as a lure to others: V. to knock one's bonnet over the eyes. BON'NETING, imp. BON'NETED, pp.: ADJ. having one's hat or bonnet knocked over the eyes; wearing a bonnet; in *nav.*, with an additional piece of canvas made to lace on to the foot of a sail in order to make more way in calm weather. BONNET, or BONNETTE, *bôn'nèt* [F.]: in *fort.*, a small defense-work, constructed at the salient angles of the glacis or larger works; consisting of only two faces, having only a parapet 3 ft. high by 10 or 12 broad—without a ditch; with two rows of palisades: a patch of earth on the top of a parapet to protect artillerymen firing *en barbette*—that is, over the parapet. BON'NET-A-PRE'TRE, *-â-prâ'tr* [F., priest's cap]: a field-work, having at the head three salient and two re-entering angles, so called from its resemblance to a bishop's mitre. BON'NETS, n. plu. the cast-iron plates which cover the openings in the valve-chambers of a pump.

BON'NET: a covering for the head, of which there are many varieties. In the French, whence the word comes, it is applied (as sometimes in English) to male as well as female head-dress. A kind of night-cap is called in France a B.; as, for example, the *bonnet rouge*, or infamous 'cap of liberty' of the revolutionary leaders. The English B. of former times was made of cloth, silk, or velvet, ornamented according to the means or taste of the wearer. This species of headgear was generally superseded by the hat, in the early part of the 16th c.; but in Scotland, bonnets were

BONNET.

universally worn for a century to two centuries later, and they remain to a certain extent a national characteristic. From the frequent notice of the blue B. in historical records and in song, it would seem that the Scotch were long identified with this kind of head-covering. The genuine old B. of the Lowland Scottish peasantry was of a broad, round, and flat shape, overshadowing the face and neck, and of a dark-blue color, excepting a red tuft like a cherry on the top. The fabric was of thick milled woolen, without seam or lining, and so exceedingly durable that, with reasonable care, a single B. worth about 2s. would have served a man his whole life. No head-dress ever invented could stand so much rough usage. It might be folded up and put in the pocket, or laid flat and sat upon, with equal impunity; it might be exposed to a heavy drenching rain without the head being wetted, and when dried, it was as good as ever. Besides, it could be worn on the top of the head, or slouched in front, behind, or sidewise, as a protective against a cold blast; and from its softness and elasticity, it very fairly saved the head from the effects of a blow. In short, there was no end to the adaptability of the old 'braid bannet,' as the Scotch termed it; and one almost feels a degree of regret that, in the progress of fashion, it should have gone so much out of use. From having been worn, till comparatively late times, by small rural proprietors—such as owners of a cottage and an acre or two of land—it gave to these local notabilities the distinctive appellation of *Bonnet Lairds*. A smaller and not so broad a variety of the B. was worn by boys. The Highlanders have long worn bonnets of the same fabric, but these rise to a point in front, and are without any rim. Such is the cap now known as the *Glengarry Bonnet*. From time immemorial, these various kinds of Scots bonnets have been manufactured at Stewarton, a small town in Ayrshire. The bonnets used in the Highland regiments are made at Stewarton and Kilmarnock; they are usually distinguished by a checkered fillet, being the *fess-chequé* of the House of Stuart. Latterly, although hats and caps have, to a great extent, superseded bonnets of the old varieties, the bonnet manufactories of Stewarton have much increased, and are still increasing.

BONNET, *bo-nā'*, CHARLES: 1720, Mar. 13—1793, May 20; b. Geneva: naturalist and philosopher. He was educated for the law, but turned at an early age to the study of natural history. A dissertation on aphides obtained for him, 1740, corres. membership of the Acad. of Sciences, Paris. He was soon afterward occupied in researches concerning polypi, the respiration of insects, the structure of the tapeworm, etc. He published his *Traité d'Insectologie* (2 vols., Par.) 1745. His *Recherches sur l'Usage des Feuilles des Plantes*, 1754, contained the result of observation on important points of vegetable physiology. A severe inflammation of the eyes, putting a stop for two years to his researches in natural history, gave another direction to his studies, and he published several works on psychology, in which materialistic views decidedly prevail: the body is

BONNET PIECE—BONNEVAL.

represented as the original source of all the inclinations of the soul, and all ideas are referred to movements of the nervous fibres; yet his religious convictions remained always strong and unshaken, and in his *Idées sur l'État Futur des Êtres Vivants, ou Palingénésie Philosophique* (2 vols., Gén. 1769), he endeavored to demonstrate the reasonableness of the Christian revelation. In this work he also maintained the future life of all living creatures, and the perfection of their faculties in a future state. Lavater translated the last part of it, and it helped to effect a change in the religious tendencies of Mendelssohn. His *Considérations sur les Corps Organisés* (2 vols., Gen. 1762) is largely given to an examination of the theories of generation. B. was for some years a member of the Great Council of his native city. In the latter part of his life, he superintended a collective edition of his own works (8 vols. and 18 vols., Neuch. 1779-88).

BONNET-PIECE: gold coin of James V. of Scotland, so called on account of the king's head being decorated with a bonnet instead of a crown, as was usual. The obverse side of this elegant coin shows the 'king's head regarding the right, with a cap or bonnet, having a circle of gems; round the neck a collar of thistle heads, and S S.' Inscription, 'JACOBVS 5. DEI G. R. SCOTORV. 1539.' Weight of the coin, 72 grains. Adam de Cardonnel, from whose work, *Numismata Scotiae* (Edin. 1786), these particulars are taken, observes, that James V. was the first Scottish sovereign who placed dates on his money, and was the first who di-



Bonnet-piece.

minished the size of the gold coin, 'by increasing their thickness. The most remarkable are those commonly called the bonnet-pieces, which were struck of native gold; in beauty and elegance of workmanship, they approach the nearest to the Roman coins, and very much surpass all the coinage at that period, or ever since.' These bonnet-pieces are among the most valued curiosities of the antiquary.

BONNEVAL. *bon-râl'*, CLAUDE ALEXANDRE, Count DE (called also Achmed Pasha): 1675-1747, Mar. 27; b. Coussac, Limousin, of a noble family: French adventurer. He was found unmanageable at the Jesuit College; and was placed in the Royal Marine Corps in his 13th year. He was transferred to the Guards; served with great distinction in Italy and the Netherlands; but having been refused promotion, on account of some excesses, he behaved with great insolence to the minister at war, and was therefore condemned to death by a court-martial. Foreseeing this result, he fled to Germany, where, upon the recommendation of Prince Eugene, he obtained employment in the Austrian service. He now fought against his native country, distinguished himself by many daring exploits, was raised to the rank of lieut. field-marshal, and bore a principal part under Prince Eugene in the war between Turkey and

BONNEVILLE—BONNY.

Austria. But when residing at Vienna, after the peace of Passarowitz, he made himself very disagreeable to the prince, and was therefore sent, 1723, as master-gen. of ordnance, to the Netherlands, where he soon made a scandalous quarrel with the governor, and was brought to trial, and condemned to death by a court-martial. The emperor commuted the sentence to one year's imprisonment; and upon condition of never again setting foot upon German soil, he was conveyed across the Tyrolese frontier. He went to Constantinople, was cordially welcomed, became a Mohammedan, took the name of Achmed, was made a pasha of three tails, was employed in organizing the Turkish artillery after the European manner, achieved successes as general of a division of 20,000 men, in the war of the Porte with Russia, and arrested the victorious career of the Persian usurper, Thamaspi Kuli Khan. For this service, the sultan appointed him gov. of Chios, but his own imprudence, and the envy of others, caused his removal from this office. He died at Constantinople. The memoirs published as his are spurious.

BONNEVILLE, *bôn'vil*, BENJAMIN L. E.: 1795?—1878; b. France: American soldier and traveller. He graduated at West Point Military Acad., and received the appointment of lieut. of artillery, U. S. A. In 1820, he was employed in building a military road through Mississippi; and from 1831—36, in exploring the Rocky Mountains and California. During the Mexican war he took part in many of the great battles, and finally in the capture of the city of Mexico. From 1862—65 he was commandant of the Benton Barracks in St. Louis, and in the latter year was brevetted brig.gen. for his gallantry and fidelity during a long service. B. published a *Journal of an Expedition to the Rocky Mountains*. Washington Irving published, 1837, *Adventures of Captain Bonneville*.

BONNIVARD, *bo-ne-vâr'*, FRANCIS DE: 1496—1570; b. Seyssel, France: historian and the hero of Byron's *Prisoner of Chillon*: educated at Turin, and became prior of St. Victor near Geneva, 1510 (at the age of 14 years). An ardent republican, he took sides with the Genevese against Duke Charles III. of Savoy. Having fallen into the hands of robbers who delivered him into the power of the Duke of Savoy, he was imprisoned (1530) in the castle of Chillon. The Genevese aided by the Bernese effected his liberation (1536). The last four years he had spent in horrid dungeons, where, by his monotonous and perpetual walking, he had worn a deep channel into the rock that formed the floor of his wretched abode. On his return to Geneva, now entirely liberated, he enjoyed the honors due to his patriotism, and was made one of the Council of Two Hundred. He wrote a history of Geneva, and other works; and has sometimes been called the Montaigne or the Rabelais of Geneva.

BONNY, a. *bôn'nî* [Scot. *bonny* or *bonnie*, beautiful—from F. *bon* or *bonne*, good—from L. *bonus*, good: Gael. *bàn*, fair, white]: handsome; beautiful; merry: N. a distinct bed of ore which has no communication with a vein

BONNYCASTLE—BONPLAND.

BONNIBELL, n. *bŏn'nĭ-bĕl'* [F. *belle*, handsome]: in *OE.*, a handsome or beautiful girl. **BON'NILASS**, n. *-lās* [Scot. *lass*, a maid, a sweetheart]: in *OE.*, a beautiful maid.

BONNYCASTLE, *bon'e-kas-sĕl*, CHARLES: mathematician: 1792–1840; b. Woolwich, Eng., son of John B., prof. of mathematics at the Military Acad. at Woolwich. He contributed articles to cyclopedias and periodicals, and assisted his father in compiling mathematical text-books. When the Univ. of Virginia was organized, 1825, he took the chair of natural philosophy, and two years later that of mathematics. He published, beside a number of other mathematical works, a treatise on *Inductive Geometry* (1832).

BONNYCASTLE, *bon'e-kas-sĕl*, JOHN: b. Whitchurch, Buckinghamshire; d. Woolwich, 1821: long prof. of mathematics at the Royal Military Acad., Woolwich. He is known as the author of many excellent elementary works, chiefly mathematical. His *Elements of Algebra* (2 vols. 8vo, 1813) is specially commended.

BON'NY RIV'ER: river of Guinea, w. Africa, forming the e. debouchure of the Niger, and falling into the Bight of Biafra, about lat. 4° 30' n., and long. 7° 10' e. It is accessible at all times of the tide to vessels drawing 18 ft., and safe anchorage at all seasons of the year is found within its bar. Its banks are low, swampy, and uncultivated. On the e. side, near its mouth, is the town of B., long notorious as the rendezvous of slave-trading ships. It exports considerable quantities of palm-oil.

BONOMI, *bo-no'mĕ*, JOSEPH: Egyptologist: 1796–1878, Apr. 3; b. London; son of Giuseppe B. (1739–1808). B. gained two silver medals when student at the Royal Acad. From 1824 he spent 15 years in Egypt and the East, studying hieroglyphics. He was artist of the Prussian expedition to Egypt under Dr. Lepsius, 1842, and curator of the Soane Museum from 1861 till his death. His works are, *Nineveh and its Palaces*; *Discoveries of Botta and Layard applied to the Elucidation of Holy Writ*, 1852, and some others.

BONPLAND, *bŏng-plŏng*, AIMÉ: 1773, Aug. 22–1858; b. La Rochelle, France: botanist. Having studied medicine and botany at Paris, he accompanied Alexander von Humboldt, 1799, to America, where they travelled nearly five years, mostly in Mexico and the Andes, during which time B. collected 6,000 new species of plants. After his return, he was appointed, 1804, director of the gardens at Navarre and Malmaison, and published several splendid and valuable botanical works, *Plantes Equinoxiales Recueillies au Mexique*, etc. (2 vols., Par. 1808–16, with 140 copperplates); *Monographie des Mĕlastomĕes*, etc. (2 vols., Par. 1809–16, with 120 copperplates); and *Description des Plantes rares de Navarre et de la Malmaison* (11 numbers, Par. 1813–17, with 64 copperplates). He went to Buenos Ayres 1816, with a collection of European plants and fruit-trees, was favorably received by the government, and named prof. of natural history. After remaining at Buenos Ayres about five years, B. undertook an expedi-

tion of scientific discovery up the Paraña, with the view of prosecuting his investigations to the Andes, across the Gran Chaco Desert; but Dr. Francia, then dictator of Paraguay, instead of giving him permission to cross the country, arrested him, after killing some of his men, and kept him prisoner for about nine years, notwithstanding the efforts of the British government, at the instigation of Humboldt, to obtain his release. While detained by Dr. Francia, he acted as physician of a garrison. He obtained his liberty, 1831, Feb. 2, and travelling southward, settled on the s. boundary of Brazil, near the e. bank of the river Uruguay, and in the vicinity of the small town of San Borja. Here he resided till 1853, taking great interest in cultivating and promoting the cultivation of Paraguay tea, and with no desire to return to Europe. In 1853, he removed to a larger estate at Santa Anna, where he busied himself in cultivating orange-trees of his own planting. In 1857 he wrote to Humboldt that he was about to carry his collections and manuscripts to Paris, to deposit them in the Museum there, and that after a short stay in France, he intended to return to Santa Anna; but his voyage was prevented by his death. His remarks on the herbarium collected in his travels with Humboldt have been given to the world by Kunth in his *Nova Genera et Species Plantarum* (12 vols., Par. 1815-25, 700 plates). See Life by Brunel (3d ed., Par. 1872).

BONSPIEL, n. *bôn'spēl* [Belgic, *bonne*, a district; *spel*, play]: a district curling match: see **CURLING**.

BONTEN, n. *bôn'tén*: a narrow woolen stuff.

BON-TON, n. *bông'tông'* [F.]: good fashion; the height of fashion.

BONUS, n. *bō'nūs* [L. good]: a consideration for some service done; a premium for a loan; an extra dividend to shareholders; a division of the profits of an assurance office to its policy-holders. A *bonus*, in case of extra profits, takes the place of a formal dividend, as it does not commit the company to a like dividend in future.

BONY: see under **BONE**.

BONYHAD, *bôn-yôd'*, or **BONHARD**: market-town of Hungary, county of Tolna, 20 m. n.e. from Fünfkirchen. Pop. (1880) 5,970.

BONY PIKE (*Lepidosteus*): interesting genus of fishes, one of the few existing genera belonging to the order, Ganoid Fishes (q.v.) Other names are Gar and Gar-pike, but not Gar-fish (q.v.) The Long-nosed B. P. or Gar-pike (*L. osseus*), attains 5 ft. length and is found from the Great Lakes to Mexico; the Short-nosed Gar-pike (*L. platystomus*) is found in the Mississippi valley; the Alligator Gar (*L. tristachus*), 10 ft., from Ill. to Cuba; all are covered with rhombic enamelled plates. The vertebræ are articulated by ball and socket, and the head is capable of a degree of motion upon the trunk very remarkable among fishes, and compensating for the general stiffness of the mailed body, the skeleton

BONZE—BOOBY.

of which is also bony, and not cartilaginous. The snout is elongated, and the edges of the jaws are furnished with long teeth, the breadth of the snout in some of the species, giving it a resemblance to that of the pike. The tail is *heterocercal*, or unsymmetrical, the caudal rays being inserted not equally above and beneath the termination of the vertical column, but only at and beneath it, a character much more common in fishes of the old red sandstone than in those of the present period.—The species of this genus are moderately numerous, attain a large size, and are found in the rivers and lakes of the warm parts of America.

BONZE, n. *bōnz*, plu. BONZES, *bōn'zēs* [an alleged corruption of Japanese, *busso*, a pious man; *bozu*, a priest: F. *bonze*; Port. *bonzo*, a bonze]: a name given by Europeans to the heathen priests of Japan, China, etc.: see JAPAN: BUDDHISM.

BOOBY, n. *bō'bī* [Sp. *bobo*, foolish: It. *babbeo*, a simpleton: Gael. *bùb*, to roar: F. *badaud*, a dolt—from OF. *badau*—from mid. L. *badārē*, to gape]: one who gapes in wonder; a dunce; a stupid fellow; a pupil at the foot of a form or class; a water-bird of the gannet tribe.

BOO'BY (*Sula fusca*): species of Gannet (q.v.), which has received this name from its apparent stupidity in allowing itself to be knocked down with a stick or taken by the hand. Accounts differ much, however, as to this character of the B., some representing it as singular in not taking alarm or becoming more wary even when it has had reason to apprehend danger from man; others, as



Booby.

Audubon, asserting in such a manner as apparently to place it beyond dispute, that it does learn to be upon its guard, and even becomes difficult to approach within reach of shot. The B. is not quite so large as its congener, the common gannet or solan-goose, and, like it, is a bird of powerful wing, and feeds on fish, which it takes by diving into the sea, observing its prey as it sweeps

BOOBY ISLAND—BOODROOM.

along in graceful and varying flight, sometimes at a height of only a foot or two from the surface of the water, sometimes twenty yards above it, and plunging suddenly to seize it. It is sometimes taken, like the gannet, by means of a fish fastened to a board, through which it drives its bill, as it dashes at the bait. The B. is of a blackish-brown color, whitish beneath; its colors are subject to some variation, and in young birds a general brown color prevails; the sexes differ very little, except that the female is not quite so large as the male. It is found on almost all tropical and sub-tropical shores, and sometimes even 200 m. from land. On the e. coast of N. America, it reaches about as far n. as Cape Hatteras, but is much more abundant further s., great numbers breeding on the low islands off the coast of Florida. The nest is often placed upon a low bush, and 'is large and flat, formed of a few dry sticks, covered and matted with sea-weeds in great quantity.' It contains only one egg or young one at a time. The expansibility of the gullet enables the B. to swallow fishes of considerable size. The bill, which is straight, conical, and longer than the head, opens beyond the eyes, as in the rest of this genus. The B. is much persecuted by the Frigate Bird (q.v.) and Man-of-war Bird (q.v.), more powerful birds and of swifter flight than itself, which often compel it to disgorge for their use the prey which it has just swallowed. The flesh of the B., though sometimes eaten by sailors, is dark-colored and not very agreeable. See GANNET.

BOOBY ISLAND: a level rock in Torres Strait, in lat. $10^{\circ} 36'$ s., and long. $141^{\circ} 53'$ e.; 3 ft. in height, and $\frac{1}{4}$ m. in diameter. Being, of course, highly dangerous to navigators, and destitute of resources of its own, it is said to be with some regularity supplied with provisions and water by passing vessels, for the benefit of such as may be cast ashore on it.

BOODHISM: see **BUDDHISM**.

BOODLE, n. *bôd'l* [origin doubtful: if from D. *boedel*, estate, household possessions, stuff, it denotes 'the whole lot,' then 'the whole company']: term of contempt or of slight for a crowd, gang. In *recent slang*, money gained in any of the many ways of defrauding the public; e.g., by bribery of officials, selling of votes, collusive contracts, etc.: also counterfeit money.—See **CABOODLE**.

BOODROOM, **BOUDROOM**, *bo-drôm'*, or **BODRUN**, *bo-drôn'*: seaport town of Asiatic Turkey, pashalic of Anatolia, finely situated on the n. shore of the Gulf of Kos, about 96 m. s. of Smyrna, in lat. $37^{\circ} 2'$ n., and long. $27^{\circ} 25'$ e. It is an uninviting place, its streets being narrow and dirty, and its bazaars of the worst class: but as the site of the ancient *Halicarnassus*, the birthplace of Herodotus and Dionysius, it possesses great interest for the traveller. Many remains of the old city, 'the largest and strongest in all Caria,' bear witness to its former magnificence. A fortress, built by the Knights of Rhodes, 1402, occupies a projecting rock on the e. side of the harbor. Pop. about 5,500.

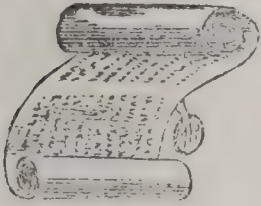
BOOK, *n.* *ḡák* [AS. *boc*, a beech-tree, a book: Goth. *boka*, writing; *bokos*, the Scriptures: Russ. *bukra*, the alphabet: Ger. *buch*; Icel. *bók*, a book; originally identical with *beech*—*lit.*, a prepared tablet of beech-wood for writing on]: printed sheets of paper stitched and bound together: a volume or part of a volume; a division of a subject; a register of transactions, as of a trader, etc.: **V.** to enter or write in a book. **BOOK'ING**, *imp.* registering in a book: **ADJ.** applied to the office at a railway station where the tickets are sold to travellers. **BOOKED**, *pp.* *búkt*, entered in a book as a passenger by rail, coach, or steamer in virtue of possessing a ticket as an evidence of fare paid; in *familiar slang*, fixed; disposed of. **BOOK'LESS**, *a.* without a book. **BOOK'BINDER**, *n.* one whose trade it is to cover the sewed leaves of a book with boards and leather. **BOOKBIND'ING**, *n.* the art or process of covering books with boards, or with boards and leather. **BOOK-DEBT**, money due to a tradesman or dealer for work done, or for goods, as recorded in his books. **BOOK-KEEPER**, *n.* the clerk who has the charge of the business books; an accountant. **BOOK-KEEPING**, *n.* the method of entering sales of goods, and all kinds of transactions in business, in books in a regular manner. **BOOK-LEARNED**, *a.* *-lérn'éd*, well read in books. **BOOK-LEARNING**, *n.* that obtained from books only. **BOOKCASE**, *n.* a case for holding books. **BOOK-MADNESS**: see **BIBLIOMANIA**. **BOOK-NAME**, *n.* in *bot.* and *zool.*, a name found only in scientific books, and not in use among the people at large. **BOOKSELLER**, *n.* one who deals in books. **BOOKSTAND**, or **BOOKSTALL**, *n.* a stand in an open place, or on the street, on which are placed books for sale. **BOOKWORM**, *n.* an insect destructive to books; one too much given to books. **BOOK'ISH**, *a.* *-ish*, given to reading; acquainted only with books. **BOOK'ISHLY**, *ad.* *-ly*. **BOOK'ISHNESS**, *n.* much devotion to the reading and study of books. **BOOK'LAND**, *n.* [AS. *boeland*]: charter land, held by deed under certain rents and services. **WITHOUT BOOK**, by memory. **IN BOOKS**, in good or bad favor, as having name in the will. **TO MAKE A BOOK**, in *betting transactions*, to enter in a pocket-book, made for the purpose, all the bets made by a person for and against a race. **NOT SUIT MY BOOK**, does not accord with my other arrangements. **MAKING A BOOK**, the arrangement of a person's bets as entered in his pocket-book. **BOOK-MATE**, a school-fellow. **BRING HIM TO BOOK**, to make him give an account or reckoning. **WASTE-BOOK**, in *book-keeping*, a book in which daily transactions are roughly noted down to serve a temporary purpose only.

BOOK, the names of sizes of: see under **PAPER**.

BOOK: a distinct literary production in one or more volumes; but the term is also applied to a treatise, or group of chapters, forming a part of a volume; and traditionally it signifies a narrative, or record of some kind in the form of a roll: 'Lo, a roll of a book was therein; and he spread it before me; and it was written within and without'

(*Ezek. ii. 9, 10*). The term has a similar meaning in English law phraseology. 'In the Court of Exchequer, a roll was anciently denominated a book, and so continues in some instances till this day. An oath as old as the time of Edward I. runs in this form: "And you shall deliver into the Exchequer a book fairly written," etc., but the B. delivered into the court in fulfilment of this oath has always been a roll of parchment.'—Godson and Burke *On the Law of Patents and Copyrights* (Lond. 1851, p. 323).

The word book is from the Angl.-Sax. *boc*, and, with some modifications of spelling, is common to all the Teutonic and Scandinavian languages (Ger. *buch*; Dutch, *boek*). It is believed to be derived from the same root as *beech* (Angl.-Sax. *boc*; Ger. *buche*; Icel. *beyke*; Dutch, *beuke*), the earliest writing among those nations having been executed on the inner bark of the beech-tree, or perhaps carved on beech boards. The Greek word for a book, *biblos*, or, more commonly, *biblion*, is derived from the Egyptian appellation for the plant papyrus (q.v.). The Latin word *liber*, a book, is derived from the name of the cellular tissue of the papyrus, instead of the plant itself. By the Greeks, a collection of books was called *bibliotheca*, and by the Romans, *libraria*; hence the French term *bibliothèque*, and the English word *library*; hence, also, the *librarii*, or book-writers, and *bibliopola*, booksellers, of the Romans. Properly prepared in long strips, the papyrus was wound round small cylinders, or rollers, which in Latin were styled *volumina*; hence the English word volume. As the papyrus has also given the term paper to the moderns, it has had an important part in the naming of what concerns books. Beside papyrus, how-



Book Scroll.

ever, the ancients used parchment and other materials for the fabrication of their books; and when, on the capture of Egypt by the Arabs in the 7th c., the papyrus plant could no longer be procured, parchment was the material generally employed.

By the Romans after the Augustan age, the art of fabricating books reached a degree of proficiency, with the advancement in literature. The papyrus was carefully prepared; one side was reserved for the writing, and the other was colored with saffron or cedar oil. The writing was effected by a pen made of a reed (*calamus*), of which the best kinds were supposed to be found in Egypt. The ink (*atramentum*) was very durable. In several rolls found at Herculaneum, the Roman ink, after being interred many centuries, is still in good preservation. When a Roman author wished to give his book to the world, a copy was put into the hands of transcribers (*librarii*), by whom a certain number of copies were produced. From these transcribers, who were equivalent to our modern printers, the copies passed to a class of artists (*librariioli*), who ornamented

them with fanciful titles, margins, and terminations. The rolls where finished for use by the *biblioepi*, or bookbinders; and last of all, they were offered for sale by the *bibliopolæ*, or booksellers. A copy of one of the esteemed productions of a Roman author—as, for example, a copy of Virgil or Horace—was an elegantly done-up roll, about thirteen inches in depth, wound round a cylinder, the two ends of which were decorated with ivory or metal knobs. Outside, it bore various decorations along with the title, and for safety was put in a neat case of parchment or wood, which also bore sundry ornamental devices, including perhaps a portrait of the author. A bookseller's shop in ancient Rome would probably show a collection of scrolls, less or more ornamented, not unlike in appearance to modern small maps mounted on rollers; and in this form books would be handed about and read. Prized for their rarity and costliness, these scroll-books were kept with great care in cases, or round-shaped boxes with lids, made of cedar; the odor of that wood being a preservative against moths and other destructive insects. Romans with a literary taste carried one of these boxes of scrolls with them as a portable library. A public library comprised a large variety of these boxes, and must have had the appearance of a collection of round canisters. Yet the Romans did not invariably make their books in rolls; in some instances, they used leaves of lead, which had been beaten thin with a hammer, and also leaves of wood covered with wax; these loosely connected at the back with rings, may be viewed as the rude original of the modern book. At Herculaneum, books of this kind, called tablets, have been discovered in perfect preservation.

In producing books during the middle ages, the plan of rolls was disused, and that of leaves sewed together and inclosed in boards came generally into use. The material employed was still parchment, prepared from the skins of goats, sheep, deer, and other animals; for though the art of making paper was known in the 9th c., this new material came slowly into use. The fabricators of the books were for the most part different orders of monks, particularly the Benedictines (q.v.), a learned and industrious body of men, whose peaceful establishments were long the great centres whence literature was dispersed in ages of intellectual darkness and social disorder. At the head of the book-manufacturing department in the monastery was the *armarian*, who, beside taking charge of the library, gave out books to be copied, along with the pens, ink, and parchment required by the transcribers. Some of the monks were allowed to transcribe in the solitude of their cells, but the business of transcription was conducted chiefly in an apartment called the *scriptorium*, provided with ranges of desks and forms. There, the scribes or copyists, who were under strict regulations as to keeping silence, carried on their tedious but useful labors. The writing was effected in distinctly formed letters in an old character; regularity in the lines and pages being secured

by previous ruling. There was an injunction that no one should on any account alter a single letter or word, without the sanction of the superior. With all the care that was bestowed, however, errors crept in, and were repeated from copy to copy, some of which mistakes have sorely puzzled the scholarly inquirers of later times. There was a division of labor in the monasteries. To some of the monks was assigned the duty of throwing in embellishments. With leaf-gold and brilliant water-colors, they adorned the devotional works, lives of saints, and copies of the Scriptures with pictorial illustrations and fancifully illuminated letters at the beginning of chapters. By another class of these monkish artists, the books were bound in styles suitable to the quality of the works. In many instances, the binding was superb. The boards of wood, covered with leather or velvet, were decorated with precious stones and devices in metal; and in front, the volume was held together with clasps of gold or silver-gilt. Skelton, the poet-laureate, in his *Garland of Laurel*, written about 1510, rapturously alludes to the splendid bindings of those old times:

With that of the boke losende were the claspis:
 The margent was illumynid all with golden railles
 And byse, enpicturid with gressoppes and waspis,
 With butterflyis and fresshe pecoke taylis,
 Enflorid with flowris and slymy snaylis;
 Envivid [enuiuid] picturis well towchid and quikly;
 It would haue made a man hole that had be right sekely,
 To beholde how it was garnisshyd and bounde,
 Encouerde ouer with golde of tisew fyne;
 The claspis and bullyons were worth a thousande pounce;
 With balassis* and charbuncles the borders did shyne;
 With *aurum musicum*† euery other lyne
 Was wrytin:

‘A book, usually known by the name of *Textus Sanctus Cuthberti*, preserved in the Cottonian Library, is a fine specimen of Saxon caligraphy and decoration of the 7th c. It was written by Eadfrid, Bishop of Durham; and Ethelwold, his successor, executed the illuminations, the capitals, and other illustrations, with infinite labor and elegance. Bilfrid, a monk of Durham, covered the book, and adorned it with gold and silver plates set with precious stones. We find also that Dageus, a monk in Ireland in the early part of the 6th c., was a skilful caligraphist, and manufactured and ornamented binding in gold, silver, and precious stones.’—*Hannett's Inquiry into the Books of the Ancients* (Lond. 1843). Books of a common quality were plainly bound in parchment, and instead of clasps, they were tied in front with thongs. In order to enable monasteries to sustain the expense incurred by their book-fabricating establishments, they were occasionally endowed with lands by pious laymen, the bequests being expressly for ‘the

* Balassis—rubies.

† *Aurum musicum*—mosaic gold.

making and mending of books.' Among the works produced were copies of the Scriptures, in whole or in part, breviaries, or books of prayers used in the church-services—missals, psalters, books in philosophy, and copies of the Greek and Latin classics and fathers; also legends of the saints. Books of history, poetry, romance, etc., were less commonly transcribed; though, from the extent of some of the mediæval libraries, it is evident that these and various other subjects were not neglected. Indeed, but for the monks we should have possessed scarcely any chronicles of the middle ages; nor are we less indebted to them for the preservation of those classics now habitually used in our colleges and academies.

The method of dispersing the books was not less remarkable than that of their transcription. Some of the books were sold at exorbitant prices; some were executed to the order of kings, nobles, and church dignitaries; some were exchanged; and some found their way into the hands of the *stationarii*, or dealers in books, in the principal cities. It was customary to lend books for transcription, under an agreement to receive an additional copy on their return. In all cases of lending books, penalties were stipulated to be paid in the event of their not being restored. Latterly, there sprang up a practice among the *stationarii* of Paris, and some other cities, of lending out books, at certain rates, on the principle of a circulating library (q. v.), by which means the poorer class of students and others were accommodated. In these later times, also, approaching the period when printing superseded transcription, the process of copying books began to be undertaken by lay scribes for a livelihood, of which there were examples in London. To the monks, however, and also to some orders of nuns, belongs the unspeakable merit of having not only supplied the religious orders with the books which were in daily use, but those which replenished the libraries of the learned and wealthy, until their ingenious craft was supplanted by that of the printer and bookseller. In the higher-class monasteries, there were libraries of from 500 to 1 000 volumes; but many of the poorer conventual establishments could boast of no more than from 20 to 30 books. In the list of effects which belonged to a monastery in Scotland—St. Serf, on an island in Loch Leven—there appear only 16 books; and yet, in this poorly provided insular establishment, the prior, Andrew Wintoun (1420), completed his *Orygynale Cronykil of Scotland*, a work in verse, not less valuable as a picture of ancient manners, than as a specimen of the attainments of the old monkish writers. But there are said to have been instances of a greater scarcity of books than in St. Serf's. Often, only two or three breviaries and missals, a psalter, and a copy of the Gospels, were all the books owned by a religious house. The possession of an entire copy of the Scriptures (the Latin version of St. Jerome) gave immense importance to a monastery or church. Nor was this surprising, when the enormous labor of transcribing a Bible, letter by letter, is

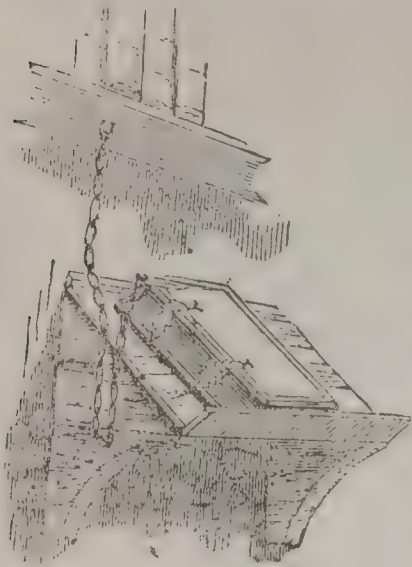


Book.—Imprint of Gaspard Philippe, Paris (1500–10)



Bookbinding of the Monastic or Byzantine Style.

considered. Alcuin, native of England, one of the most industrious and ingenious monks of his time, occupied himself from about 778 to 800, 22 years, in making a copy of the Bible for the Emperor Charlemagne.



Chained Book.

This ancient and extremely interesting monument of piety and labor is now in the British Museum, which became possessed of it for the sum of £750. The Museum is also enriched with a variety of missals and other works, executed by the monks. In the present day, it is scarcely possible to form a correct idea of the value put upon books, even of a common order, or of the prodigious care which was taken of them, during

the middle ages. To preserve them from embezzlement, they were in some cases chained to shelves and reading-desks; and in the dwellings of nobles, a volume might be seen chained to a table in the hall, for the use of such members of the family as were able to read.

The establishment of universities in the 12th c. greatly stimulated the manufacture of books by transcription, more particularly those classics and philosophical treatises that were required by students in the colleges. The anxiety of the authorities in these schools of learning to insure accuracy in the text-books, as well as to prevent the use of books of an improper kind, led to the establishment of censorship and privileges which interfered with the preparation of, and traffic in, books, long after the invention of printing. Unfortunately, while this art was superseding the ancient process of transcription, the convulsions consequent on the Reformation caused an enormous destruction of books. In England, the libraries of monasteries, representing the labor of a thousand years, were mercilessly destroyed on the spot, or carried off and consumed in base uses, without a thought as to their value. In Scotland, the monastic libraries which had escaped the ravages of Danish and other invaders, were similarly destroyed. The same fate overtook the ancient monastic libraries of France at the Revolution. See **LIBRARIES**.

In consequence of these deplorable events, as well as the perishableness of books, copies of works prior to the invention of printing exist only as rare and valuable curiosities. Even of the early printed books, there are comparatively few copies extant. In England, books of improved typography and binding, adapted for ordinary libraries, date no further back than the reign of Queen Anne. In proportion as literature has been popularized, books have diminished in bulk and costliness. In the 16th and 17th c., the ordinary sizes of books were folio and quarto; and as works of these huge dimensions embraced light as well as much pon-

derous literature, a popular poet uses no metaphor, when he observes that ladies 'read the books they could not lift.' The dignified quarto survived in imaginative literature even till our own times; for it was in this costly form that the early editions of the poetry of Scott, Byron, and others made their appearance. Excepting for special purposes, all such large sizes are happily superseded by octavos and still smaller books. Forms and prices are no longer for the few, but for 'the million.' And copies of the Bible, instead of being chained to shelves and desks, and being valued at hundreds of pounds, are now scattered in myriads at the easy charge of a quarter of a dollar, or without charge to any who are moneyless.

The dimensions of printed books are regulated by the size and form of the sheets of paper of which they are composed. A sheet, being folded in the middle, forms two leaves, or four pages; and a book of this size is called a folio. When the sheet is again folded, so as to make four leaves, or eight pages, it forms a quarto. The quarto, being folded across, so as to make eight leaves, or sixteen pages, forms an octavo. By folding the sheet into twelve leaves, or twenty-four pages, is made a duodecimo; and if into eighteen leaves, or thirty-six pages, an octodecimo. Below this there are small books of different denominations, sometimes spoken of as pocket editions. Booksellers are accustomed, in speech, to anglicise the terms for the sizes of books, with little regard to the proper terminations—as 4to, 8vo, 12mo, 18mo, 24mo, 32mo, 48mo, etc. For a long period, printing-paper was made chiefly of three sizes, respectively called royal, demy, and crown; and according as any one of these was employed, the size of the book was large or small. Demy, however, was the most commonly used, and the demy 8vo may be said to have become the established form of standard editions of books. As by means of the paper-making machine, paper is made in webs, and can be cut into every imaginable size of sheet, and as printing-machines can print very large surfaces, the sizes of books are now comparatively arbitrary; though, for convenience, the old names remain, with the difference, that instead of the 12mo, a not very dissimilar size, called the post-8vo, has come extensively into use.

A thin kind of book, consisting of a few sheets sewed or stitched together, without boards, is called a pamphlet—a term supposed to be derived from the French words *par filet*, 'by a thread.' The French term *brochure* (from *brocher*, to stitch), signifying pamphlet, is coming into use; as also the French word *livraison*, signifying a portion of a book (group of volumes) published separately. For an account of the modern traffic in books, see **BOOK-TRADE**.

BOOKBINDING.

BOOKBINDING: art of fastening together and covering the sheets of paper composing a book. The early form of books being either rolls of papyrus or wax-covered tablets, the art of B. in its present form appeared first with the introduction of leaves of parchment or papyrus instead of rolls. This improvement in form is attributed by Dibdin, though on somewhat doubtful authority, to Attalus II., King of Pergamos, about B.C. 150, and though used to a considerable extent by the Greeks, was a novelty to Martial in Rome as late as A.D. 100. From this time to the invention of printing, B. was done almost exclusively by the monks; and great labor was bestowed on the covering of their most precious manuscripts. One of the oldest specimens existing is the St. Cuthbert Gospels in the British museum, bound about A.D. 700. It is covered with velvet heavily ornamented with silver inlaid with gems. A fine example of the early monastic style is shown on Plate XII., the covers being of hard wood with a figure of Christ carved on an ivory plaque in the centre, surrounded by gold filagree work, containing 16 jewels. All monastic binding has the same characteristics of heavy boards with strong metal clasps and bands, though the materials varied from the plainest parchment and iron to ivory, enamels, and mosaics with jewelled silver and gold. The invention of printing and the dawn of the Renaissance wrought a revolution in B. The contrast between the clumsy, inartistic productions of the monasteries and the masterpieces of taste and beauty from the library of Jean Grolier (q.v.) is sharp and striking, and no productions of later times have surpassed in artistic beauty the work of these nameless Italian and French binders employed by Grolier, Maioli, and others. It is in the reign of Henry III. of France (1574–89) that the name of the binder first appears, Nicholas and Clovis Eve being the first of whom we find mention. An example of the work of one of the most famous French binders of the 17th c., Nicolas Padeloup, is shown on Plate 13. The most important event in the art of B. since the invention of printing was the introduction of cloth for covering, 1820–30, by John Pickering, a London publisher, and Albert Leighton, a bookbinder. The use of cloth aided greatly in the multiplication of cheap books, not only on account of the cheapness of the materials, but also because the process of binding allowed a much greater use of machinery than in the case of books bound in morocco. The machinery used in B. is nearly all of American invention, and has greatly reduced the cost as well as increased the rapidity of production.

Bookbinding may be divided into two classes, 'Extra work,' i.e., books bound with extra care, and by hand methods which are still very similar to those employed 300 years ago, and 'Edition work,' done principally by machinery in large quantity.

EXTRA WORK.—The book comes from the printer in flat sheets of 8, 16, 24, or 32 pages each, which are folded by girls with an ivory folder, so that the pages come in consecutive order. Although great care must be taken,

BOOKBINDING.

an expert folder will fold on an average 400 sixteen-page sheets per hour. Piles of the folded sheets, now called *signatures*, are next laid in regular order on a long table, and a girl picks up one of each signature as she passes along, making a complete book when she reaches the end, the process being called *gathering*. The book is then *collated*, that is, examined to see that no signature has been omitted or duplicated; this is done very rapidly by bending the book so that the signature number, which is on the lower left-hand corner, can be seen. In order to make the book solid, it is next beaten with a heavy, broad-faced hammer, or subjected to pressure in a press.

Sewing is done on a frame called a *sewing-bench*, on which bands or cords are stretched in a vertical position, and to these the signatures are attached by passing the needle and thread through the middle of the signature and around each band or cord, the number and location of these cords being shown on a bound book by the raised bands on the back. In most work at the present time grooves are sawed in the backs of the books, into which the cords fit, and the raised bands usually seen on the backs of fine books are put on by strips of pasteboard before the leather is drawn on.

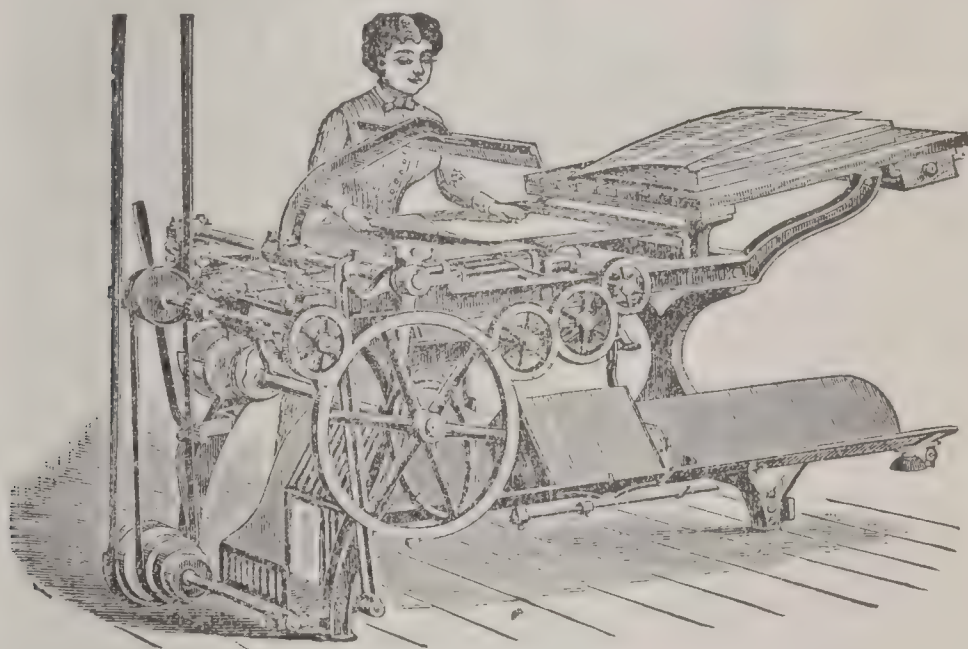


Fig. 1. Folding Machine.

After the colored *lining papers* have been pasted on, the back is covered with glue, and before the glue has thoroughly hardened the back is rounded by beating it in a peculiar way with a hammer. The book is then placed between *backing boards*, and the edges of the back beaten in such a way as to form the two projections against which the covers rest. The edges of the book are next trimmed by a knife called a *plow*, while the book is held firmly in a press. Before cutting the front edge, the back is struck forcibly against the table so as to render it flat, and the volume, firmly held, is placed in the press and clamped.

BOOKBINDING.

After cutting and release, the book springs back to its former round, leaving the front concave. In the most particular class of work, the boards are laced to the book *before* it is cut by the plow.

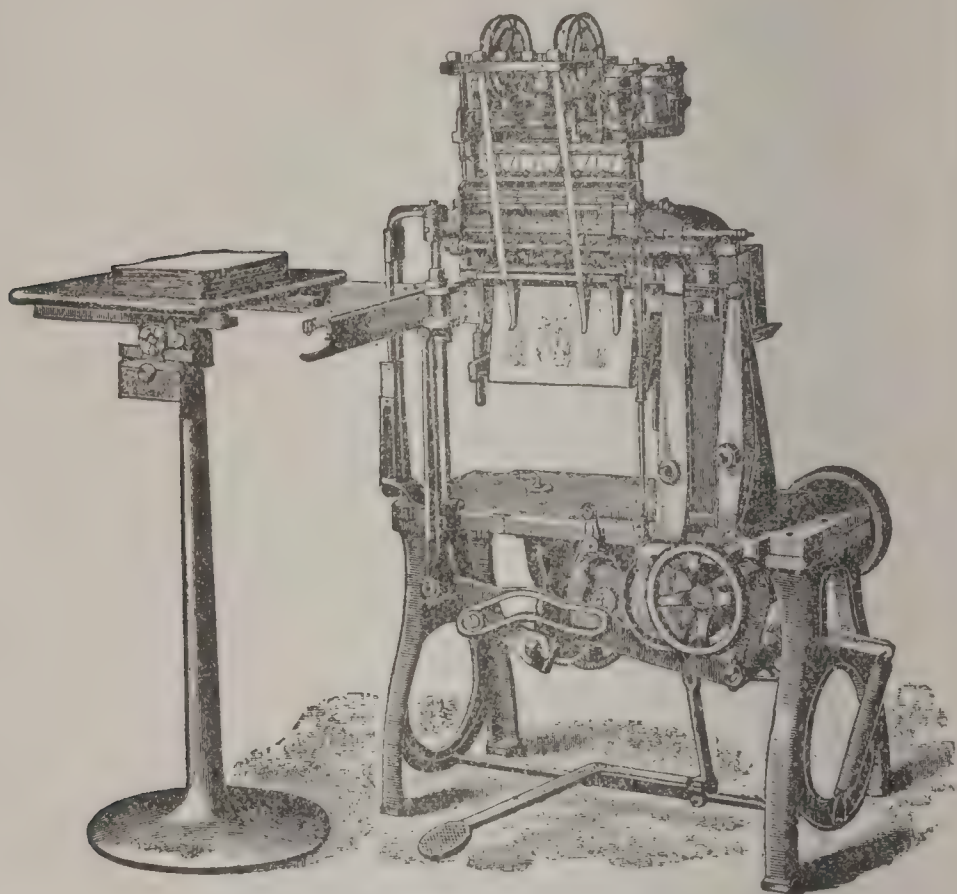


Fig. 2. Thread Sewing Machine.

The ends of the cords to which the signatures are sewed, and which are allowed to project an inch or two, are securely laced to the boards forming the cover, and the ends glued down on the inside of the cover. As the name implies, the material used for covers formerly was wood, but is now a thick pasteboard rolled very hard. The book is now ready for gilding, marbling, or otherwise coloring the edges. *Marbling* is a separate trade, requiring peculiar skill and adroitness, but in large establishments is combined with B. Prepared colors are thrown into a shallow trough containing a preparation of gum tragacanth and other substances boiled in water, on which the colors float and spread, and are by skillful manipulation made to assume the desired appearance. The edges of the book are dipped into the liquid, and the colors adhere. After the edges are thoroughly dry, they are burnished.

Gilding is done by laying thin sheets of gold-leaf on the edges of the book, which have first been scraped very smooth and covered with a preparation of white of egg, and which, when dry, are thoroughly burnished.

The *headbands*, which are next attached, are purely ornamental, and serve to give a finished look to the head and tail of the volume. They consist of pieces of parchment

BOOKBINDING.

worked over with colored silk by a process that partly fastens them to the back. The back is then lined with strong paper glued on, the amount of stiffening varying with the size of the book and style of binding. Most books are now made with open or loop backs, a paper loop being pasted to the back of the book, and to this false bands are glued. The leather being cut a little larger than the book, is dampened, then covered with paste and drawn smoothly over and turned in, and the covers pasted down to the colored linings of the book.

Finishing.—In the process of finishing there is room for display of much artistic taste. The ornamentation and lettering of fine bindings all are done by hand, the workman employing a great many tools and ornaments, which he first heats and then presses on the gold-leaf, which has previously been laid on the leather over a coating of white of egg. Ornamentation without gold is called 'blind tooling,' and is produced by rubbing or stamping the hot tool on the dampened leather. Though there are no books bound now that have such a wealth of ornamentation and so many days of careful labor given to the finishing as was common in Grolier's time, there are many rich and tasteful bindings produced and many novel effects by the use of inlaid colored leathers, incised leather, etc.

EDITION BINDING.—In describing the methods of binding used on probably nine-tenths of all books bound at the present time, it will be necessary only to indicate the points in which the processes vary from extra work.

The chief difference is in the use of machinery in place of hand work. *Folding machines* are of many varieties and great complexity, and machines are made that will fold at one operation two signatures of 32 pages each, folding a sheet containing 64 pages of *The Columbian Encyclopedia* in two signatures at the rate of 3,000 per hour. The most common form is shown in Fig. 1, which will fold from 8,000 to 12,000 signatures per day, according to the expertness of the operator, while 4,000 a day by hand can be done by only the most expert folders.

Gathering Machines.—Instead of taking up the signatures as the gatherer passes along in front of a long table, there are now various devices by which the table containing the folded signatures is made to travel in front of the gatherer. The signatures are still taken off by hand, but the economy lies in the fact that a dozen girls can work in the space formerly occupied by one, and do the work more rapidly.

Smashing Machines.—A variety of machines and presses are used to press the books before sewing, instead of hammering as of old. The most common form is shown in Fig. 4, the same machine being used as a smasher or as an embosser and inker.

Sewing Machines.—There are two principal varieties of sewing machines for book work: one stitches the signature through the centre to a piece of crash with a wire staple, and the other sews through the signature with thread. The latter is now much more largely used, and

BOOKBINDING.

is shown by Fig. 2. The capacity of the machine depends on the operator, but a good hand will sew 10,000 to 18,000 signatures a day, as against 3,000 to 4,000 a day for the most expert hand sewers.

Rounding is still done by hand in nearly all binderies, and the *backing* done by a machine which holds the book in a vice and passes a roller over the back, rolling out the edges to make the ledge for the cover. A machine has been invented, however, which performs both the rounding and backing at one operation.

Trimming is done by a machine (Fig. 3) which holds the books under a clamp, and presents the ends and front to a knife which cuts them by a downward and lateral motion.

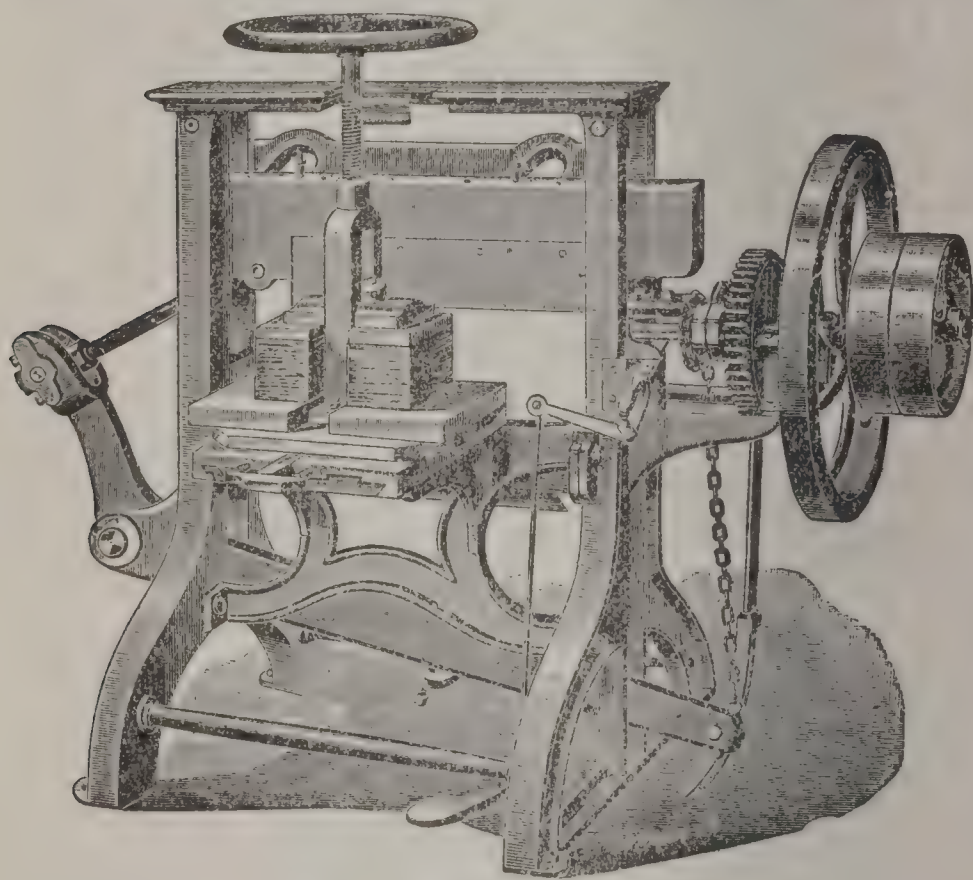


Fig. 2. Book Edge Trimmer.

Case Making.—In edition work the covers, called *cases*, are prepared and finished separate from the volume that they are to cover. A piece of cloth, cut somewhat larger than necessary to cover the entire book, is covered with glue on the inside. Pieces of millboard, previously cut to proper size by an ingenious machine having rotary knives, are laid on, and the cloth turned over, the proper distance between the two boards being maintained by a steel gauge. The lettering or design that is to be stamped on the cover is cut in brass or steel, and after the portion of the cover that is to show a gold lettering or ornament has been covered with gold-leaf, the stamp, which is fastened to the head of the embossing press, is heated by steam or gas, and pressed on the gold. All the gold not touched by the stamp readily brushes off, and is carefully saved and

BOOKBINDING.

melted down; even the rubbers and cloths used in the operation are after a time burned to extract the gold they have absorbed. If ink is to be used, the same embossing press is used (see Fig. 4), but inking rollers pass over the face of the stamp, and the powerful stroke of the press not only inks the cloth, but crushes the grain and gives the smooth, glossy surface, though in good work it is necessary first to emboss the design with a hot stamp.

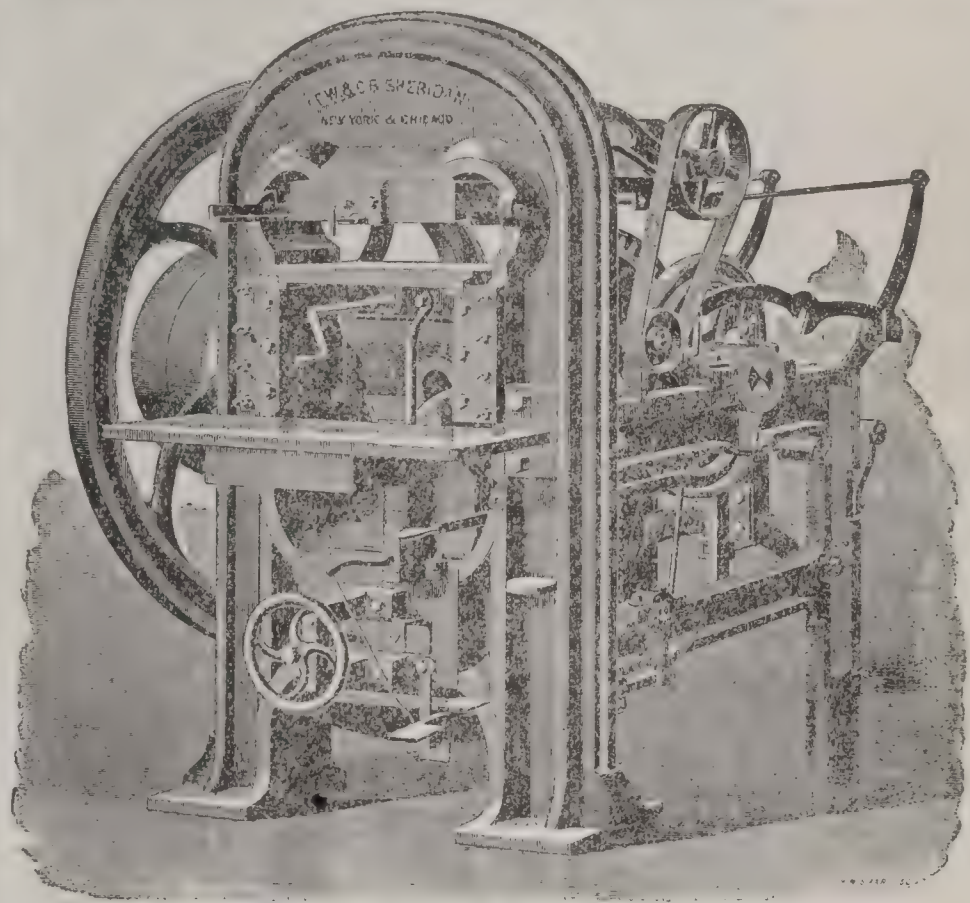


Fig. 4. Inking and Embossing Press. Also used as a Smashing Machine.

Casing In.—The book and the cover, having been prepared separately, now come together. The outside of the book being covered with paste and placed in the cover, the completed volume is placed in a standing press between boards with brass edges which press into grooves between the cover and the ledge on the back, giving the grooved appearance common to most cloth books, though they are often pressed in plain boards, in which case the boards of the cover are brought close to the back so as to leave no groove in the cloth. The books are left in the press till thoroughly dry, when they are ready for the bookseller.

PAMPHLET-BINDING.—The immense quantities of paper-covered books and magazines produced in every large publishing centre give rise to separate bindings for this class of work, where the folding and other work is done with even greater rapidity than in book work. Most of this is stitched by a machine which drives a wire staple through the side of the magazine near the back, which makes the strongest of all bindings, but on account of the



Bookbinding of Nicholas Padeloup.



Various Forms of Boomerang.

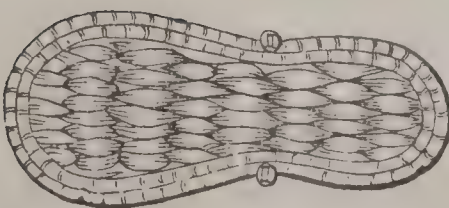


Fig. 1. Common Sandal of the Ancient Egyptians. Fig. 2. Ancient Greek Ornamental Sandal.

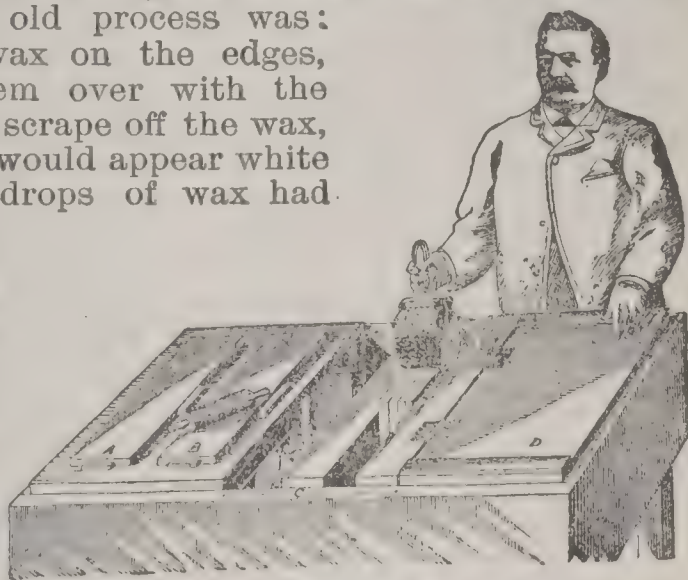
difficulty of fastening the book so sewed in a cover, and the still greater objection to the stiffness of the back, it is not adapted to book work.

BOOK'-CLAMP: in *book-binding*, a vice for holding a book while being worked. Adjustment is made by the nuts for the thickness of the book, and the pressure is given by the lever and eccentric. The term is applied also to a holder for school-books, etc., while carrying them. The cords pass through the upper bar; they are tightened by the rotation of the handle.

BOOK'-CLUB, or Book Society: association of individuals for purchasing and reading new books as they issue from the press, which, after being circulated among the members, are sold for the benefit of the concern. In some cases the used books are disposed of by auction among the members. For another method of circulation, common in Britain, see **CIRCULATING LIBRARIES**.

BOOK-EDGE ROLLER: implement in book-binding, for putting a colored edge (known as wax-edge) on blank-books. The old process was: sprinkle hot wax on the edges, then brush them over with the desired color, scrape off the wax, and the edges would appear white wherever the drops of wax had adhered. By

the new process the ink is taken from a marble slab by a perforated composition roller—patented by F. E. Grady, of Brooklyn, N.Y.



—which is then passed over the edges of the books, producing exactly the same effect with much greater rapidity, and avoiding the many serious disadvantages of the old process. It is used in the U. S. govt. bindery at Washington, and by leading manufacturers.

BOOKER, JOHN: English astrologer: died 1667. He was successively hatter and prof. of penmanship at Hadley. Later he commenced the study of astrology; and gained such a reputation that he was appointed to review the works published on astrology and mathematics. His most important work is entitled: *Mercurius Cælicius, or A Caveat to All the People of England* (1664).

BOOKER, LUKE: 1762–1835: b. Nottingham: English author. He was rector of Tedstone, and published a number of theological and other works.

BOOK'-HOLDER: a reading-desk top, or equivalent device for holding an open book in reading position.

BOOK-KEEPING.

BOOK'-KEEPING: art and method of recording business transactions in a set of blank-books kept for the purpose, by all classes of traders, as well as in various kinds of establishments. Viewed as an art, B. was brought to comparative perfection first by the merchants of Genoa and other cities in the n. of Italy; and developed by the merchants of the Netherlands, it was brought to England, in which country, as also in the British colonial possessions and the United States, it is now carried on in the best manner by professional accountants and skilled clerks in counting-houses. The books employed are usually of a folio size, strongly bound. For security against loss, it is customary to remove them every night from the desk and ordinary shelves in the counting-house to a fire proof safe.

Although reduced to an accurate system, the details of B. necessarily differ according to the extent and the nature of the transactions to be recorded. In all kinds of B., however, there are or ought to be certain pervading principles. The object is to keep an account of the goods that a trader buys and sells, and the money that he pays away and receives; also to show, at short and periodic intervals, the exact state of his affairs—what are his *assets* (property and sums of money owing to him, and what are his *liabilities* (debts owing by him, and other pecuniary obligations). On the proper accomplishment of this object obviously depend the stability and the reputation of the trader; for otherwise he must, in great measure, be proceeding upon vague, possibly erroneous conclusions; the result of which may be bankruptcy. Viewed as credentials, a merchant's books are invested with a certain sacredness. Such a set of them is to be kept as will at all times admit of a satisfactory statement of affairs being made. This requires great neatness, accuracy, and perspicuity. As a rule, there should be no blotting, no scraping out of words or figures, and no tearing out of leaves—the records are to be beyond suspicion of falsification.

SINGLE ENTRY.—The simpler kind of accounting is called B. by Single Entry; the principal books used being the Day-book, Invoice-book, Cash-book, and Bill-book, all employed for recording the transactions as they occur, and a Ledger, to which the entries are afterward transferred, under the names of the parties concerned. The method is called Single Entry, for the reason that the items are entered only once in the ledger.

Day-Book.—The purpose of this book is to keep a daily account of all goods sold on credit—that is, goods not paid for at the time by the buyer. The book is ruled with a date-line on the left-hand side of the page, and with double money-lines at the right-hand side. The entry of a transaction comprehends the name of the purchaser, and beneath it a note of the articles sold, with the prices extended to the first money-column. The gross amount added up is extended to the second money-column; so that the amount of all sales may easily be summed up. After the name of the purchaser, it is usual to put *Dr.*, and to articles in the entry is prefixed *To*—the meaning of these

insertions being that the party named is *debtor* to the concern for the articles mentioned.

Invoice-book.—This book, similarly ruled, is sometimes called the *Credit Day-book*. It is used for keeping an account of all goods bought on credit. When the goods are bought, an invoice, or account of them, accompanies the package, or is received by post, and on being checked off, the items are copied into the book. After the name of the seller of the goods is inscribed the contraction *Cr.*, and to the items entered is prefixed the word *By*—the meaning of which is, that the party named is *creditor by* having sold the articles named. For the sake of brevity, some dealers enter merely the name of the creditor, the date, and the amount; and preserve the invoices, by docketing and tying them up in parcels, or by fastening them into a paper book prepared for the purpose. In any case, the invoices should always be preserved.

Cash-book.—In this is kept an account of all cash received and paid, and of discount received and allowed. It is ruled for date and double money-columns on each page. Two pages, one opposite the other, are required for the entries; that on the left hand for entering cash received, and the discount allowed *by* the trader; that on the right hand for the cash he pays, and the discount allowed *to* him. The first money-column on each page is for the discount, and the second for the cash. For example, if a person settle his account, amounting to \$20.00, less a discount of \$1.00, the sum of \$1.00 is entered in the first column, and \$19.00, in the second; by which means a record is kept of the accounts settled and the money actually received. A similar explanation applies to the 'cash paid' side. At the close of business for the day, the amounts on both sides are summed up and balanced.

Bill-book.—This contains an account of all 'Bills Receivable'—that is, bills of which the trader is to receive payment; and 'Bills Payable'—that is, bills which he has to pay. Sometimes, however, in the case of large concerns, these two classes of bills have each a distinct book. The books are ruled in a particular manner, to admit of an explicit statement of dates, amounts, length of term, and other particulars: see **BILLS**.

Ledger.—This is the great book of the concern. It comprehends an abstract of the entries in the day-book, invoice-book, cash-book, and bill-book, the whole collected in a methodic form under the names of the various persons, whether standing in the relation of debtors or creditors to the trader; and not only so, but an account of the trader's own private debit and credit. Two sets of columns are assigned to every person's account, one for *Dr.*, and the other for *Cr.* The copying of items from the day-book, etc., into these ledger accounts, is termed posting. According to the ordinary practice, books are posted after short and regular intervals—not longer than a month. Having books at all times well posted up is an acknowledged mark of a good man of business. By means of a well-posted ledger, and an inventory of stock and other

assets, drawn up with a prudent regard to realizable value, the trader is able at the end of a year to make a *Balance-sheet*, or condensed statement of his affairs. A proper balance-sheet ought to show the amount of capital invested in the form of money, stock, debts, etc.; also the amount of liabilities, the expenses at which the business has been conducted, the money drawn on private account, and the profit that is over, after all deductions have been made.

Some other books of a subsidiary kind are kept by large trading houses—as an *Order-book*, in which copies of all orders are entered; a *Memorandum-book*; an *Account Sales-book*, from which particulars are obtained for making out accounts of the sales of goods which may have been sent for disposal on commission; a *Stock-book*, in which an inventory is kept of the stock on hand; an *Account-book*, to contain a list of accounts; a *Warehouse-book*, to contain an account of the quantities of goods; a *Letter-book*, into which letters sent out by the firm are copied; with some others.

With such a set of books, and a few additional memoranda, a trader could doubtless strike a balance at the end of the year. He could see how much was owing to him, how much he was owing to others, how much he had spent, and how much would remain over, or how much would be deficient, after all accounts *pro* and *con* were settled. But by this elementary routine he could establish no satisfactory check on different departments of his business; and for large and complicated concerns, the system, if not absolutely valueless, would prove exceedingly imperfect. What the wholesale trader wants is a process of checks—one book checking another—the whole mass of details reduced to such a rigorously methodized system of entries that every fraction is thoroughly accounted for. No doubt, to effect this elaborate and minute system of B., a considerable expense is incurred for clerks; but in large establishments this is of small account in comparison with the advantages.

DOUBLE ENTRY.—The method of B. which has been so called is only an extension of that already noticed. The distinct peculiarity in double entry concerns chiefly the ledger. Its object is a system of checks, to be effected by entering transactions in the ledger twice—first to the *debtor* of one set of accounts, and then to the *creditor* of another set. In making the two entries, one is posted to an account under the name of the debtor or creditor, and the other is posted to an account under the head of the goods that have been bought or sold. Take, for instance, the article sugar. Say, the trader purchases a hogshead of the article from A. Brown & Co. He first enters it in the regular way to the *Cr.* of A. Brown & Co., and then turning to the folio headed ‘Sugar,’ he enters it on the *Dr.* side of the account as bought from A. Brown & Co. In the same way, when the hogshead is sold to E. Frazer & Co., it is entered first to the *Dr.* of these parties, and then to the *Cr.* side of sugar as sold to E. Frazer & Co. By this system of double entries, one the counterpart of the other, the one set of

BOOK-MAKING—BOOK-STALLS.

accounts constantly checks the other set; a trader can also ascertain how, when, and at what prices his property has been disposed of.

In double entry, a book called a *Journal* is frequently used. The entries in the day-book, etc., are abstracted into the journal, and thence posted in a brief form into the ledger; the use of the journal, therefore, is only to save the ledger from being burdened with details.

Acknowledged to be the triumph of accountantship, B. by double entry, or by the Italian method, as it is sometimes called, is not an entire safeguard against frauds and fallacies in the conducting of commercial operations, which, independently of every technical aid, require to be sustained by constant integrity, vigilance, and discretion. Among the fallacies in the method of keeping books which are observed to sap the stability of the most gigantic concerns, are two so conspicuous as to demand notice. The first consists in including bad or nearly worthless debts in the periodical lists of assets. The second is that of not estimating stock at its realizable value only. This last may be said to be a common error among traders, many of whom, without any evil intention, and simply from want of prudent consideration in making due allowance for depreciation of property, delusively and gradually slip into a condition of hopeless insolvency.

B. forms a department of school education in connection with penmanship and arithmetic. There are various useful treatises on the subject, with forms for day-book, ledger, and other books. Among the larger and more comprehensive of this class of works are, *A Complete System of Book-keeping*, by Benjamin Booth (Lond. 4to), Jones's *Science of Book-keeping Exemplified* (Lond. 4to); *Practical Book-keeping*, by F. H. Carter (Edin.). Among the smaller and more accessible treatises is *Book-keeping by Single and Double Entry*, by W. Inglis (Edin.). No method of school instruction can supersede the practical knowledge which is to be procured only in a busy and well-conducted counting-house.

BOOK'-MAKING: act or practice of entering in a book wagers of odds against the occurrence of a specific doubtful event—e.g., that a specified horse will win a specified race (see **GAMBLE: HORSE-RACING**). The 'book-maker,' called also the 'layer,' offers odds—3 to 1, or \$1,000 to \$300, \$200, \$100, \$50, etc.—against each horse in the race. In any event, he loses \$1,000 or whatever the sum may be which he wagers; but as there can be only 1 winning horse, he calculates to win from the 'backers' of the others more than enough to reimburse him. See **BETTING: POOL**.

BOOK-STALLS: see **BOOK-TRADE**.

BOOK-TRADE.

BOOK'-TRADE: business of dealing in books, in which are engaged two classes of persons—Publishers, who prepare and dispose of books wholesale; and Book-sellers, to whom the retailing of books more properly belongs. Although frequently distinct, the two professions may conveniently be treated together. While publishing, apart from book-selling, is of modern date, the selling of books is as old as the origin of literature. Copies of the works of authors in manuscript were sold in the cities of ancient Greece and Rome. Horace celebrates 'the brothers Sosii' as eminent book-sellers (*bibliopolæ*). With the foundation of several universities in the 12th c., the preparation and sale of books increased; but the trade of book-selling attained importance only after the invention of printing. The first printers acted also as book-sellers, and, being mostly learned men, they were generally the editors, and, in some instances, the authors of the works which they produced. See PRINTING. Faust and Schœffer, the partners of Gutenberg (q. v.), carried the productions of the Mainz press to the fair of Frankfort-on-the-Main and to Paris. Some instances of division of the two branches, printing and bookselling, occurred in the 15th c. John Rynmann of Augsburg (1497–1522) styled himself, at the conclusion of his publications, 'Archibibliopola of Germany.' In consequence of the Reformation the seats of learning were gradually removed from the southern to the northern states of Germany, and the book-sellers followed their customers.

Migrating from place to place, and also resorting to the great continental fairs for customers, the early book-sellers became known as *stationarii*, or stationers, from the practice of stationing themselves at stalls or booths in the streets, as is still customary with dealers in old books. The term stationer, long held to be synonymous with book-seller, is in modern times commonly applied to dealers in paper and other writing materials.

Whether settled or migratory, the early publishers and sellers of books were subject to a number of restrictions, as is still the case in France and Russia. In England the book-trade was trammelled by royal patents and proclamations, decrees and ordinances of the Star Chamber, licenses of universities, and charters granting monopolies in the sale of particular classes of works. In 1556, in the reign of Mary, the Stationers' company of London was constituted by royal charter, the professed aim being the 'removal of great and detestable heresies.' The members of the company were made literary constables to search for books, etc., and it was ordered 'that no man should exercise the mystery of printing, unless he was of the Stationers' company, or had a license.' The charter, confirmed by Elizabeth in 1559, in effect empowered the company to make ordinances as to the printing and sale of books, and to exercise an arbitrary censorship of the press. The crown, by an act 13 and 14 Car. II. c. 23, commonly called the 'Licensing Act,' assumed this species of control over the issue of books. The Licensing Act, and its

renewals, ultimately expired in 1694. By the first Copyright Act, 8 Anne, c. 19, the legislature interposed to protect the rights of authors, and to relieve them, as well as publishers, from the thralldom of the Stationers' company. But by the same act, the Abp. of Canterbury, the Lord Chancellor, and certain judges in England, and the judges of the court of session in Scotland, were empowered, on the complaint of any person, to regulate the prices of books, and to fine those who sought higher prices than they enjoined. This provision was in force till 1738, when it was abolished by the act of 12 Geo. II. c. 36. From this time the book-trade was free. How it spread and flourished may be best learned from the history of the literature with which it is identified. Subsequent to the reigns of Anne and George I., there was a succession of men of literary repute connected with the metropolitan book-trade; among whom may be mentioned Cave, conductor and publisher of the *Gentleman's Magazine*, and early patron of Samuel Johnson; Dodsley, poet and dramatist, who reached the head of the book-selling profession; and three generations of the Nicholsons. We might also include Richardson the novelist, a printer, who in 1754 became master of the Stationers' company. The names of Baldwin, Rivington, Longman, Tonson, Miller, Cadell, Dilly, Lackington, Knight, Bohn, and others, will also be as familiar as are the Macmillans and Murrays of later times.

Now, as formerly, the book-trade of Britain is centered in London, though carried on to considerable extent in Edinburgh, and in a less degree in Oxford, Cambridge, Dublin, Glasgow, and a few other places. There are various reasons for London being the metropolis of English literature. As a centre of wealth, taste, and intellect, authors flock toward it as an agreeable and permanent home, and find in the Library of the British Museum the most ample materials for reference and study. By means of its system of railways, and its port, assorted parcels of books can be conveniently dispatched to all parts of the United Kingdom, and of the world. It has numerous wholesale stationers, and abounds in printers, book-binders, artists, and wood-engravers. Stationers' Hall, in which the rights to literary property may be inscribed, is in London. Through its channels of literary intelligence and criticism it possesses the most ample means of making new works known. Through favor of these circumstances, the metropolis becomes the centre of the British book-trade; almost every new work floats toward it, either for publication or to be issued wholesale on commission. In 1878 there were connected with the book-trade, within the bounds of the London post-office district, 296 book-sellers who were also publishers, and 446 book-sellers alone. Of these, about 18 confined their business almost exclusively to the sale of foreign books, and 15 to the publication and sale of law-books. Among the book sellers are included commission-houses; and among the publishing establishments are several branches from Edinburgh

The greater number of the publishing and commission-houses are in Paternoster Row and the courts adjoining; and in whatever part of the metropolis books are primarily issued, they may be found in one of the establishments in or about 'the Row,' or in Covent Garden or Fleet Street. In Scotland, the book trade was carried on in Edinburgh, about the middle of the 18th c., by Allan Ramsay (q.v.). Among his successors were Donaldson, Bell, Elliot, and Creech; and later, Archibald Constable, first publisher of the *Edinburgh Review* and *Waverley Novels*; William Blackwood, originator of *Blackwood's Magazine*; Adam Black, publisher of the *Encyclopædia Britannica*; T. Nelson & Sons, and W. & R. Chambers.

In the infancy of the trade authors frequently resorted to the plan of getting friends and patrons to subscribe for copies of their forthcoming works; the publisher in such cases acting only as commission-agent. Dryden's translation of Virgil's *Æneid* was sold in this way. There were, in the case of that work, two classes of subscribers, one paying five, the other two, guineas for a copy. Those who paid the larger sum obtained the additional value by individually receiving a dedication plate with their arms underneath. There were 101 of the first class of subscribers, and 250 of the second. Pope made a fortune by his *subscription* books. He realized upward of £5,000 from his translation of Homer's *Iliad*, and £3,000 from that of the *Odyssey*, both sold by subscription. Johnson, who lived in the transition state between the old and new way of disposing of literary works, perceived that the subscription system was essentially unsound, and that book-sellers formed a proper and necessary medium between authors and the public. 'He that asks for subscriptions soon finds that he has enemies. All who do not encourage him defame him.' And again: 'Now learning is a trade; a man goes to a book-seller and gets what he can. We have done with patronage.' Literature has now risen above this degrading system.

The plan of issuing neat, cheap editions of popular works was originated 1760-70 by Alexander Donaldson, an Edinburgh bookseller; and was followed by several publishers in London, one of whom, C. Cooke of Paternoster Row (1790-1800), issued an extensive series of cheap reprints, of a pocket-size, called *Cooke's Editions*, which for tastefulness of preparation have never been excelled. Donaldson's experience in regard to *Thomson's Seasons*, with the copyright laws, furnishes an instructive incident: see COPYRIGHT. About 1817-18 some enterprising book-sellers began to break through certain old usages of the trade, by issuing reprints of standard works in good typography, at considerably reduced prices. At the same time numerous cheap periodicals began to appear: see PERIODICALS: NEWSPAPER. In 1827, the Soc. for Diffusing Useful Knowledge began to issue its low-priced scientific treatises, and Archibald Constable began the cheap series of works in original literature, *Constable's Miscellany*. To the period 1827-32 may be referred the ori-

gin of the 'cheap press.' Constable's attempt to cheapen literature was happily coincident with a general awakening in the public mind, and was very successful; imitations followed; a variety of serial works, in small volumes, for popular use, made their appearance. A similar popularizing of the price of periodicals was the next step. At this juncture, taking advantage of the growing demand for cheap literature, and desirous of guiding it in a right direction, William and Robert Chambers (q.v.), of Edinburgh, began 1832, Feb. 4, to issue *Chambers's Edinburgh Journal*, a weekly sheet at 1½d.; on Mar. 31 appeared in London the *Penny Magazine* of the Soc. for the Diffusion of Useful Knowledge; and July 7, the *Saturday Magazine*, issued under the direction of a committee of the Soc. for Promoting Christian Knowledge (see PERIODICALS). A multitude of cheap publications of various kinds followed, facilitated by two great inventions—the paper-making machine and the cylinder printing-machine—within the preceding 20 years. The continued issue of cheap reprints of popular works out of copyright has changed the aspect of the trade; and though works at old prices are as numerous as ever, cheap books of an improving tendency are now within general reach: new and copyright works also are issued in cheap form, in boards, with colored paper covers. On the platforms of railway termini and stations, are stalls for the sale of books, periodicals, and newspapers. These stalls, consisting of a counter and some shelving, which can be closed in with shutters at night, are rented from the railway companies by different book-sellers, from whose head establishments supplies ceaselessly radiate. One British firm, in 1888, had 600 stalls. A London publisher (Routledge) reported 1885 that in the 12 months preceding he had printed 6,000,000 books. The sudden and successful rise of a cheap press—the same in its chief developments in Britain and in America—was not viewed with complacency by the fathers of the trade, and for a long time it was believed that, like many other novelties, it would have its day and disappear. Regarded, therefore, as temporary and undignified, the cheap press was left to force its way in the hands of two or three ardent young publishers, who, extending their operations, at length assumed a position which could not fail to command respect and to excite emulation. Then the old established firms began, though in a hesitating way, to issue a cheap class of publications, by reprinting and otherwise. At the same time, these firms, besides generally maintaining the old prices, unite to keep a few editions of standard works in print. These 'trade editions,' as they are termed, are printed and supplied in shares; each party concerned taking an interest in their sale. In Great Britain, six-penny editions have been common for many years; but in 1881 a new departure was made by several leading publishers, in the issue of both copyright and non-copyright works at the price of sixpence each. The first sale of *Tom Brown's School-days* was 150,000. Subscription circulating libraries were introduced 1842 by C. E. Mudie in London; and

BOOK TRADE.

grew to vast proportions in Great Britain. The firm (1888) had bought 6,000,000 vols., was employing 200 persons, and supplying 40,000 subscribers. As many as 3,000 copies of a single work at 18 shillings or a guinea are sometimes added; so that in many cases what would formerly have been considered to be large editions are absorbed by one purchaser. After several months the overplus copies are sold at from half to one-quarter of the original price. There are other great libraries of similar kind. In the United States this system has not been largely in use.

The selling of second-hand books from open stalls, and from booths (q.v.), is a practice so ancient as to be connected with the trade of the stationarii of the middle ages. Some men of considerable note in the book-trade began in the humble quality of stall-keepers. The most celebrated instance of this kind is perhaps that of James Lackington. He commenced his remarkable career by keeping a small stall of old books, which, while working as a shoemaker, he placed at his door in one of the obscure streets of the metropolis; and from his ultimate success was able to inscribe the proud boast, *Sutor ultra crepidam feliciter ausus*, on his very entertaining memoirs. Michael Johnson, bookseller in Lichfield, England, was in the habit of setting up a stall for the sale of his wares every market-day, in Uttoxeter. On one occasion, confined to bed by indisposition, he requested his son Samuel to visit the market and attend the stall in his place, which he refused to do. How this act of criminal pride and filial disobedience preyed in after years on the mind of the great lexicographer, and how, in his old age, to expiate this juvenile delinquency, he went to Uttoxeter on a market-day, and stood on the site of his father's stall for the space of an hour, bareheaded, in the rain, exposed to the jeers of the bystanders, are among the most characteristic circumstances narrated in the life of this extraordinary man. The dealers procure supplies chiefly at public auctions of the libraries of deceased clergymen, professors, and private gentlemen. At these auctions, good editions of standard books may usually be obtained at moderate prices; but rare and curious works, prized by the 'bibliomaniac,' frequently bring very high sums: see BIBLIOMANIA. There is a growing scarcity of second-hand high-class works, in consequence of the purchase of large quantities for public libraries forming in the United States. From France, Italy, and Germany, there has been a similar export-trade in splendid old editions to North America.

At one period, it was usual to limit editions to from 500 to 1,000 or 1,250 copies, and impressions of 2,000 were considered excessive. Now, large editions, particularly works of standard authors, are published in a cheap form. As the cost of composition (setting the types) is the same for a large as for a small edition, and as the charge for press-work is only a little more for a larger than a smaller impression, the profit on a book rises rapidly in proportion as the quantity put to press increases. In

the case of cheap books, it is absolutely necessary that large impressions be sold, in order that they may realize any profit to the publisher. In preparing this class of books, therefore, to the extent of from 20,000 to 50,000 impressions, the element of composition dwindles into insignificance. The chief things taken into account are paper, machine printing, and boarding. Paper, however, being the matter of most serious concern, the weight is rigorously computed beforehand by putting a sample volume into the scales. To avoid delay, and also to save outlay in preparing future impressions, it is customary to stereotype cheap books and periodicals. Although, like composition, stereotyping forms a minor charge, the accumulation of stereotype-plates at length becomes considerable, and, as in the case of overplus stock, forms a burden on the capital of the publisher.

The cheapening of books, contrary to fears entertained on the subject, has in no perceptible degree caused literature to deteriorate. The sale of books of grossly demoralizing tendency has been driven into obscurity, and in other ways circumscribed by law; and it is demonstrable, as regards periodicals, that those of objectionable kind form a very small proportion of the whole. Little dependence can be placed on statements as to circulation of weekly and monthly periodicals below the highest grade, as statements by the less reputable members of the trade are almost without exception fictitious, and for the purpose of attracting advertisements. The circulation of some British religious magazines is very large; of two published at sixpence monthly, by the Religious Tract Soc., one sells to the extent of 160,000, and the other 85,000. In Great Britain 1888 there were 1,500 monthly periodicals, of which more than 300 were religious.

Entirely separated from the general book-trade, there flourishes in Great Britain, and to considerable extent in the United States, the *Canvassing Trade*, which consists in the plan of disposing of books in weekly and monthly numbers or parts. Canvassers are employed to go from door to door to procure subscribers; and the numbers are delivered periodically, till the work is completed. Books sold in this manner are necessarily much dearer than if disposed of through the ordinary channels of trade; but the plan accommodates certain classes of customers, and has been the means of circulating Bibles, with notes and illustrations, and works of piety in particular, in quarters not reached by the operations of the bookseller. In the United States, a canvassing method, usually known as the Subscription book-business, and not limited to the sale of works in numbers or parts, has had great development, and has brought large pecuniary returns.

A distinct kind of trade in Britain is that of printing and publishing authorized versions of the Bible, New Testament, and Book of Common Prayer. The preparation of these works has always been a prerogative of the crown, which grants exclusive privileges or patent rights to certain parties for the purpose. The last patent

for England was granted by George IV., to Andrew Strahan, George Eyre, and Andrew Spottiswoode, for a term of 30 years; and having commenced 1830, Jan. 21, it expired 1860, Jan. 21, and was then renewed during pleasure. The universities of Oxford and Cambridge have enjoyed the right of printing Bibles, etc., in common with the patentees; but they have no power to prosecute. In the case of the Revised New Testament, issued in 1881, the University authorities had the sole right of publication; over one million copies were sold (by the Oxford press alone) on the first day of its appearance. One noticeable feature in the trade in Bibles is that the publishers in England sell large numbers in sheets to bookbinders, who do them up in various styles; some very neatly, with gilt edges. From their cheapness and their accuracy, English-printed Bibles and New Testaments are purchased in large quantities by the United States. Although the printing of the authorized version of the Bible, the New Testament, and the Book of Common Prayer, with as well as without notes, seems to be reserved to the nominees of the crown, practically no objection is taken to the printing of these works by others, nor has any objection ever been raised to those printed with notes and comments.

British publishers are under the legal obligation to deliver, free, a copy of every book they issue (new editions without alterations excepted) to the five following public institutions: Library of the British Museum; Bodleian Library, Oxford; University Library, Cambridge; Trinity College Library, Dublin; and Library of Faculty of Advocates, Edinburgh. Decision was given 1887 that a copy also of every American work issued in Great Britain, though printed and originally published in America, must be sent to the British Museum: see COPYRIGHT.

Unitedly, the whole trade of publishing and book-selling forms an important staple of British industry. In reckoning the number of new works issued from the press in Britain annually, we may take the number of entries of distinct books, volumes, sheets, maps, etc., lodged by publishers at the British Museum, in terms of the Copyright Act. In 1886, were so lodged 11,548 vols.; under international copyright, 1,397: music, 5,296 pieces. In 1893, the number of new books (maps, pamphlets, etc. not included) was 5,129, an increase of 214 over any previous year. In 1886, the books imported into the United Kingdom were valued at \$1,132,190. Of these, the value from Germany was \$100,295; France, \$317,440; Holland, \$298,995; Belgium \$90,435; United States, \$273,360; others, \$20,340. The value of English printed books exported in 1886 was \$5,583,685. The United States purchased to the amount of \$1,466,410; Australasia, \$1,955,175; Canada, \$419,095; British India, \$569,925. The exports in 1891 were \$6,490,000. Exports are five or six-fold more than imports: the export to Australia alone being nearly twice as much as the import from all countries, and to the United States almost a third more than the total im-

ports. The high wages of labor in the United States, causing high cost of production, enables a large British export trade in books to this country.

In Germany, where printing originated, the book-trade became also first established, and the principal mart was Frankfurt, to the fairs of which the early book-sellers and printers resorted. Leipsic, also, became a great mart for books as early as 1680; yet this ancient city is only one of many places of book preparation in Germany. Among them Stuttgart has taken a front rank, since about 1830, as an agency place for the s. German book-trade, while Frankfort has now entirely lost its ancient prestige. From the various places of publication a great proportion of entire editions of works is transferred to commissioners at Leipsic, who, through a system of agencies there established, disperse the books throughout Germany and all those countries (Holland, Belgium, Denmark, Sweden, Norway, etc.) for whose book-trade Leipsic forms the nucleus. Hence, it is that literary, artistic, and scientific activity is not monopolized by any single city, and authors do not need to resort to a metropolis for professional labor. The German method of sending, by means of commissioners, parcels of new works, on sale or return, may not accord with the notions of other countries, but some of its advantages are obvious. Literary and scientific novelties are immediately made known on a simple plan to those interested in the subject; and the great English and American expenditure on advertising is avoided. From the teeming press of Baron Bernhard Tauchnitz, of Leipsic, had issued, by 1888, a series of more than 2,000 vols. of cheap reprints of English popular works in a pocket-size, which are sold largely in Germany and other countries. These *Tauchnitz Editions* are issued in virtue of an honorable arrangement with British publishers and authors; yet it is illegal to bring them into Great Britain.

In France, publishing is carried on chiefly in Paris, where there are many extensive printing establishments, including the *Imprimerie Nationale*, provided with machinery of the finest grade. French books are usually done up simply in colored-paper covers for temporary service; but the ink is generally better than that used in England, and works of a superior class are executed with a high degree of taste—the excellence of pictorial embellishments being always conspicuous. The French press has been noted for fine *editions de luxe*. Certain voluminous and most expensive works in French, and also in the classical languages, occasionally issue from the Parisian press, and command a large sale, orders of copies for universities and public libraries all over the continent tending to promote these gigantic enterprises. French books have large export to foreign countries.

In the Dutch Netherlands, various cities in the 17th c. were prominent in the book-trade. At Amsterdam, some of the most beautiful editions of the classics, and large numbers of illustrated books, were executed; while from

BOOK TRADE.

Leyden and other seats of learning, exports of works in law, theology, etc., formed a prosperous commerce. Holland now produces few books in any other language than its own; but the demand for books in the Protestant parts of the country, and the number of booksellers, is perhaps larger proportionately than in any other part of the world. Belgium has a flourishing book-trade, and Brussels, as a kind of minor Paris, is the seat of extensive printing and publishing concerns.

In Spain, book-selling is almost defunct. In Italy, there are signs of revival, through the activity of booksellers who have entered from Germany.

In the United States, the book-trade, which is daily assuming vaster proportions, has sprung up from small beginnings within the 19th c., and publishing is done in many cities. The chief centres are New York, Boston, Philadelphia, and Chicago; but many books are published at Hartford, Springfield, Albany, Buffalo, Baltimore, Washington, New Orleans, Charleston, Cincinnati, St. Louis, San Francisco, and other places. The great distributing houses are at New York, Boston, Philadelphia, and Chicago; in the United States and Canada there are 6,000-7,000 booksellers; two-thirds of whom unite a miscellaneous collection of trades with that of book-selling. A few of the larger publishing houses print, bind, and manufacture the books which they sell. English publishers and authors for many years protested against the numberless Amer. reprints of British copyright works in spite of remonstrance. Probably many of those who strongly justified their action in availing themselves of the liberty which the law gave, were actively opposed to a change in the law. They saw not how such a change could be made with equitable consideration of all rights involved. Among other questions bearing on the subject, one concerned the respective rights of British authors and British publishers. For the agitation which ended in a change of the law 1891, see COPYRIGHT.

Though the book-trade in this country is of comparatively recent growth, Hezekiah Usher was in the business at Boston 1652, and printing was introduced into New York as early as 1683. Sower, Potts & Co. were publishing almanacs and German Bibles near Philadelphia 1740. Benjamin Franklin (q.v.) was famous among the early printers. In 1820, the book production of this country for the year was estimated at only \$2,500,000, of which 30 per cent. were original American books; (1830) \$3,500,000, 40 per cent. American; (1840) \$5,500,000, or 12,000,000 vols., 55 per cent. American; (1850) \$12,500,000, 70 per cent. American; (1856) \$16,500,000, 80 per cent., American. These rough estimates show the steady increase in the proportion of original American works.

The following shows the number and classification of new books published in the United States in 1902, according to the *Publishers' Weekly*:

BOOK TRADE.

DIVISIONS.	Books by Amer. authors, incl new eds. manf. in U. S.	Books by Eng. and other foreign authors, incl. new eds. manuf. in U. S.	Books by Eng. authors impt'd in sheets into U. S.
Fiction.....	903	818	75
Law.....	622	2	16
Theology and Religion.....	433	78	128
Education.....	408	108	63
Literature and Collected Works.....	311	136	96
Juvenile.....	388	39	87
Poetry and Drama.....	220	130	49
Biography, Correspondence.....	253	37	95
Physical and Mathematical Science...	257	19	80
Description, Geography, Travel.....	267	13	83
History.....	178	59	64
Medicine, Hygiene.....	243	30	26
Political and Social Science.....	223	8	40
Fine Arts: Illustrated Gift Books....	110	47	60
Useful Arts.....	126	6	33
Philosophy.....	62	26	15
Works on Reference.....	98	2	11
Domestic and Rural.....	73	9	14
Sports and Amusements.....	46	8	7
Humor and Satire.....	49	3	2
Totals.....	5,210	1,578	1,045

The *Publishers' Circular* of London reports the production in Great Britain as follows:

DIVISIONS.	1901.		1902.	
	New Books.	New Editions.	New Books.	New Editions.
Theology, Sermons, Biblical, etc....	441	78	567	81
Educational, Classical, Philological.	541	77	504	68
Novels, Tales, and Juvenile Works..	1,513	478	1,743	727
Law, Jurisprudence, etc.....	109	37	88	46
Political and Social Economy, Trade and Commerce.....	351	104	463	130
Arts, Sciences, and Illustrated Works	310	28	420	44
Voyages, Travels, Geog. Research..	174	30	162	38
History, Biography, etc....	438	93	480	57
Poetry and the Drama.....	202	60	272	76
Year-books and Serials in volumes..	344	.....	408	..
Medicine, Surgery, etc.....	169	68	153	84
Belles Lettres, Essays, Monographs, etc.....	293	32	227	44
Miscellaneous, including Pamphlets, not Sermons.....	70	3	352	147
Totals....	4,955	1,089	5,839	1,542

The *Bibliographie de la France* summarized the production in France (1893) as 13,595, an increase of 472 from that of 1892. The number of musical compositions 5,952.

A table prepared by Heinrichs of Leipsic shows for Germany (1887) total production of books 15,972—educational and theological works being the classes most numerous.

The trade in the United States is usually classified in three divisions: publishing, jobbing, and retailing—about 1,700 names being given in the *American Catalogue* of

those who publish occasionally, though probably nine-tenths of the trade is carried on by about a hundred houses. There were (1893) about 570 firms publishing *books*—in New York 182, Boston 53, Chicago 53, Philadelphia 50. The 'subscription publishers' sell their books through agents and canvassers. Educational books, while forming a special branch of the trade, are sometimes made a department in the regular business of prominent houses. The jobber is the middle-man who orders books in large quantities from the publisher and distributes them to the retail booksellers throughout the country. Trade-sales, at which new publications and standard works are sold at auction in lots to dealers, are held in the spring and autumn in New York. The American publishers generally allow the retailers from 25 to 50 per cent., and the jobbers 5 per cent. more, special discounts being often given on 'first orders,' placed by the seller as soon as the new books are ready. The copyright of a book runs for 28 years, with privilege of renewal for 14 years by the author, his widow, or children. A copy of the title-page must be registered in the office of the librarian of congress at Washington before publication, and two copies of the best edition must be sent to the same office on, or before, the day of publication. The fees are 50 cents for recording entry, and 50 cents for any copy of record: there is no other expense. This, however, does not, as in the case of patents, cover any investigation into the validity of the copyright, the librarian of congress being only a registering, and in no sense a judicial officer.

In the United States, as in Britain, various arrangements are made between authors and publishers; though it is usual in this country for the publisher to allow the author a royalty or copyright payment of 10 per cent. on the retail price of all sales. Often, however, the publisher buys the copyright for a gross sum paid to the author. Various methods which may be adopted are the following: (1) the author sells his work in manuscript to the publisher for a specified sum, giving him an assignment of the copyright, and leaving him to bring out the work according to his own fancy; or (2), the author retains the copyright, pays all expenses, undertakes all risks, and gets a publisher to bring out his work; or (3), the author, retaining the copyright, incurs no risk, and only allows the publisher to print and issue an edition of a certain number of copies for a sum agreed on; or (4), the author and publisher issue the work at their joint risk, and on such other terms as are mutually agreeable; or (5), the publisher agrees to issue at his own risk and expense the works of a popular author—the clear profits to be divided into 3 equal shares, 1 for author, 2 for publisher—or author receiving half the profits (perhaps 20 per cent. on each volume sold); or (6), the familiar royalty system, by which the publisher takes whole or partial risk, and pays the author a certain sum per copy after the disposal of a certain number of copies. In some instances, the publisher will not undertake to issue a work unless the author gets it printed and delivers copies ready for sale; in others, he will relieve the author of this

trouble, and, risking outlay, keep an account of charges and sales. Any plan by which an author retains a risk, is seldom satisfactory. Publishing is an exceedingly hazardous profession. Works of which the highest expectations are formed may not pay expenses; and books of a frivolous and seemingly worthless kind may prove exceedingly remunerative. There is much misapprehension of the hazardous nature of publishing, and of the heavy expenditure ordinarily incurred for making new books known. For one book that is highly successful there are numbers that become a dead stock in the warehouse, and barely pay expenses.

In publishing new books in Britain or America, these items of outlay are to be taken into account: Copyright, paper, setting up the types, author's corrections, electrotyping, press-work or printing, embellishments, binding, presentation copies to editors for review, and to public institutions in terms of the Copyright Law. Later come the great advertising and selling expenses. When the author retains the copyright, the publisher charges, beside the above items for printing, etc., a commission on the sales of the work. New books are issued at a certain selling price to the public, and the publisher allows a percentage off the price to the retail bookseller. In a large proportion of cases there is interposed the commission-agent. It is usual, on issuing new books, for publishers or their agents to send out the work to be 'subscribed' among the trade. Beside making the trade acquainted with the day of publication of expected works, this practice offers opportunity for speculating. As an encouragement to do so, the work is offered at a somewhat lower rate than is allowed afterward. Throughout the more conservative and established part of the trade, there is constant effort to maintain prices; for when a book can be obtained by booksellers below trade-price, it is spoiled for regular business. On the other hand, there are now many retail booksellers who sell new books to the public at prices little above cost. This system of under-selling was long resisted in the trade, and the heads of the profession refused to deal with undersellers; but these, appealing to the public, ultimately conquered; and now books of all kinds are disposed of at such prices as the bookseller pleases. Whether publishers will in time adopt the expedient of lowering nominal selling-prices, at the same time lessening allowances, or, whether they will altogether drop the marking of prices, are questions on which opinions differ. It is evident that, considering all ordinary deductions, losses, etc., publishers can reckon on receiving little more than half the nominal price of their books. To limit impressions to the demand is always important for the publisher, for, unlike most other kinds of goods, the overplus stocks of books are often nearly valueless.

In one important respect the American or British publisher differs from the producer of almost every other class of goods. He has not only to manufacture the article, but also to make it known to the public, while the retail

book seller has little else to do than to hand across the counter the book for which a demand has been stimulated by the costly efforts of the publisher. The grand difficulty with the publisher is to excite general attention to his wares. Hence, the stupendous advertising system in newspapers and other channels of intelligence. Some publishers spend enormous sums on advertisements—\$25,000 and more annually; and many \$5,000 to \$10,000 per year. The monthly and quarterly periodicals being important advertising channels, it is of consequence for publishers to possess one of these, both for the revenue that it may produce, and for keeping their own books before the public. A well-circulated periodical, therefore, is almost a necessity to a great publishing business. It is a general practice to employ one or more clerks to write, arrange, and distribute advertisements, and to conduct the multifarious correspondence connected with them. These burdensome outlays, with the liberal distribution of copies of books for review, make the prices of original works higher than the actual amount of paper and print would warrant.

The American book-trade was supplied with a bibliography made by the *Bibliotheca Americana* of Roorbach, a catalogue of publications including American issues from 1820, continued by Kelly in supplements; this is now superseded for current books by the admirable *American Catalogue*, begun by F. Leypoldt, continued by R. R. Bowker and others, containing entries of all books (including imported editions) in print and for sale in this country. The first vol. indexes by book-titles and authors' names about 70,000 books; the second vol. classifies the works under subjects. The bibliography is brought to 1890 by 2 vols. issued 1885, 1892; after 1890, annual vols. The trade publications are the *Publishers' Weekly*, New York, begun as the *Weekly Trade Circular*, 1872, by F. Leypoldt (which afterward absorbed Child's *Publishers' Circular*, founded 1852); and the *American Book-seller*, published fortnightly. The *Publishers' Weekly* is especially valuable for its weekly record of current publications giving full titles, sizes, prices, and other information entered in accordance with the cataloguing rules of the American Library Assoc. and furnished with descriptive notes giving briefly the scope, character, and contents of the books. The *Trade-List Annual*, issued by the *Publishers' Weekly*, is a bulky volume containing the latest catalogues of the principal American publishers bound in one book, and arranged alphabetically by publishers' names.

American books are now executed with neatness and taste; their wood-cuts, notably those in the *Century*, *Scribner's*, and *Harper's Magazine*, have of late been brought to a remarkable beauty both in design and in printing. On account of the prevalence of education, and also the aspiring habits of the people, book-buyers of a humble position in life are greatly more numerous than in the United Kingdom. Few books are purchased by the Irish immigrants, but the Germans are buyers, and many of the colored people are eager in their thirst for knowledge, and their children are beginning to be provided with schools. The American

trade, after all yet but partially developed, may be expected to advance in a vastly accelerated ratio. Latterly, several English publishers have established branches of their business in New York; and there are now some extensive American commission-houses in London—from which intercommunion happy results may be anticipated. Books are sold wholesale by written orders, trade-sales, auctions, and otherwise. Country dealers are in the habit of visiting the great book-depots of Boston, New York, and Philadelphia, and there personally making their selections. As previously stated, there is a large export of American books to Canada and other British possessions, in which, as yet, native literature is on a poor scale, but where there is a large and increasing number of readers.

In doing up books in cloth boards, the American binders almost invariably cut off the outer folds of the sheets, so as to smooth the edges of the leaves, as in English leather binding, by which process the first readers of new books are spared the trouble of cutting open the leaves. Many persons have wished to see this improvement, for such it is, introduced into England. There are still, however, prejudices to be overcome on the subject. Strange as it may appear, numbers of purchasers like to cut up the leaves with a folder as they advance through a new book or periodical, from an idea that the repeated slight interruptions heighten the pleasure of perusal. Gentlemen have been known who would not sit down to read a cut-up new book. Besides, there is a notion among buyers in England, that books with smooth-cut leaves may be second-hand, and not worth the price of new. Undoubtedly, the Americans are ahead of Europeans generally in this particular.

Notice has been taken of the constant export from Europe to the United States of quantities of high-class books to stock the great public libraries everywhere springing into existence through the liberality of state legislatures, or the munificence of private individuals. There is, however, a traffic of a similar kind, especially from England, in execution of orders for second-hand books from dealers who have establishments in most of the principal cities, through whose agency persons of refined tastes are becoming acquainted with the aspect of the older English literary treasures. One of these second-hand book-stores in Philadelphia is on an immense scale, presenting a choice which appeals to the delicate perceptions of the bibliomaniac.

For a variety of particulars bearing on the book-trade in general, see BIBLIOGRAPHY: BOOK: BOOK-BINDING: CENSORSHIP: CIRCULATING LIBRARY: COPYRIGHT: NEWSPAPERS: PAPER: PERIODICALS: PRESS: PRINTING: STATIONER: STEREOTYPING: WOOD ENGRAVING.

BOOLAK: see BOULAC.

BOOLE, GEORGE: 1815, Nov. 2—1864, Dec. 8; b. Lincoln: distinguished mathematician. He started a school at Lincoln, 1835; and, from 1849 till his death he was prof. of mathematics in Queen's College, Cork. He was one of the foremost mathematical thinkers of his time. Among

BOOLEY—BOOM.

his publications are one on *Analytical Transformations* (1839); on a *General Method in Analysis* (1844); *Mathematical Analysis of Logic* (1847); and on *Probabilities* (1834).

BOOLEY, n. bó'ly [Ir. *buachail*, a cowherd—from *bo*, a cow; *gille*, a boy]: an Irish nomad; one of a horde, Tartar-like, continually moving from place to place, and subsisting on the milk of the cattle which they drive.

BOOM, n. bóm [Dut. *boom*, a tree or pole: Ger. *baum*, a beam]: a long pole or spar used in a ship to stretch out any particular sail at the bottom; chain, rope, spars, or other obstacle across a river or harbor to hold logs, or prevent the approach of hostile ships. BOOMS, n. pl. bómz, in *nav.*, space in a ship's waist used for boats and spare spars.—BOOM, in a *ship*: general name for the long poles which jut out from certain supports or uprights, to stretch or extend the bottoms of sails. Some taper regularly from the middle toward both ends; while others have the thickest part at about one-third the length from one end. According to their particular modes and places of application, they receive the names of *jib-B.*, *flying jib-B.*, *studding-sail B.*, *lower studding-sail B.*, *main B.*, *square-sail B.*, *driver-B.*, *spanker-B.*, *ring-tail B.*, *main-topmast B.*, *fore-topmast B.*, *fire-B.*, etc. In the old 110-gun ships of Nelson's days, these booms varied from 57 to 32 ft. in length, and from 15 to 6 inches in thickness. The war-steamers of the present day require a somewhat different equipment of booms. The immense spread of canvas in some of the clipper merchant-ships now built requires the use of long booms. A seaman speaks of 'booming' when he applies a B. to a sail; he employs *B.-irons*, shaped like the figure 8, to connect booms and other spars together end to end.

Beside the booms on board ship, the same name is given also to a floating though fixed obstruction, such as a line of heavy logs strongly moored, to confine timber from floating away; or to a strong iron chain, floated by logs, employed in barring the passage of the mouth of a harbor or river, or to cut off the retreat of an enemy if he has actually entered—the B. being protected by batteries. A modern war-steamer would cut through a chain-B. unless of very thick and strong iron. The Russians effectually boomed the harbor of Sebastopol, 1854, Sep., preventing the entrance of English and French ships; this was done partly by sinking some of their own ships, and partly by the laying of booms.

BOOM, n. bóm [Dut. *bommen*, to sound like an empty barrel when beaten upon: Gael. *beum*, a heavy blow]: to sound loud and heavy, as a gun; to rush quickly, as a great ship through the water; to roll and roar, as a river rising and swelling in rapid flood. Also, in the United States (since 1878), to become suddenly active, prosperous, important, or prominent—as a business, or a town, or a candidacy for office: to stimulate into sudden activity; to push into prominence by use of vigorous, and often of concerted, means: N. a hollow roar, as of a cannon-ball rushing through

BOOM—BOOMERANG.

the air. Also, in the United States, an increasing roar, as of a swollen river; sudden increase (usually temporary) in value or in prominence; spontaneous or stimulated advance in price—as of lands, etc.—or growth in popular favor, as of a candidate. **BOOMING**, imp.: **ADJ.** designating a dull, loud and hollow sound: **N.** a dull, hollow, roaring sound, **BOOMED**, pp. *bômd.*

BOOM: town of Belgium, province of Antwerp, about 10 m. s. of the city of Antwerp. Its situation at the junction of the Brussels canal with the river Rupel makes it a place of considerable trade. It has numerous and extensive brick and tile works, breweries, tanneries, rope-walks, sail-cloth manufactures, etc. Pop. (1890) 13,892.

BOOMERANG, n. *bôm'ér-äng*: a curved wooden missile, for war, sport, or the chase, thrown by the natives of Australia with wonderful precision, so as to return of itself toward the thrower. It is of hard wood, of bent form; the shape is parabolic, as represented in the adjoining



Boomerang

cut. It is about $2\frac{1}{2}$ in. broad, $\frac{1}{8}$ in. thick, and 2 ft. long, the extremities being rounded. One side is flat, the other rounded; and it is brought to a bluntish edge. The method of using this remarkable weapon consists in throwing it in a particular manner. It is taken by one end, with the bulged side downward, and the convex edge forward, and thrown directly onward, as if to hit some one thirty yards in advance. Instead of going directly forward, as might be expected, and there falling to the ground, it slowly ascends in the air, whirling round and round, and describing a curved line of progress till it reaches a considerable height, when it begins to retrograde, and finally it sweeps over the head of the projector, and falls behind him. This surprising motion is produced by the bulged side of the missile. The air impinging thereon lifts the instrument in the air, exactly as by hitting the oblique bars in a windmill it forces it to go round. The ingenuity of this ancient weapon, which is worthy of the highest scientific calculation, is very extraordinary as coming from almost the lowest race of mankind. Australian aborigines are said to be very dexterous in hitting birds with it, the animals being of course behind them, and perhaps not aware that they are objects of attack. This curiosity, as it must be called, was first made known by being brought before the Royal Irish Acad. by Professor M'Cullagh, 1837, May.

BOON—BOONE.

BOON, n. *bón* [AS. *ben*, petition, prayer: Icel. *beidne*, and *bón*, desire, a petition]: request; answer to a prayer or petition; a favor granted; a free gift.

BOON, n. *bón*: the woody heart of dried flax.

BOON, a. *bón* [L. *bonus*; F. *bon*, good]: gay; merry, as *boon companion*.

BOONE, *bón*: city of Iowa, cap. of Boone co., on the Chicago and Northwestern r.r., and terminus of the St. Louis, Des Moines and Northern r.r. B. is in a rich farming region; has large coal trade: in the vicinity is abundance of superior clay for brick and tile making and pottery. Chief manufacturing establishments are brickyards, tile-works and potteries, glove, moccasin, harness, and carriage factories, iron foundry, meat-packing house. There is a courthouse and a city hall; churches, 20; school buildings 6, with 1,600 pupils enrolled and 28 teachers; newspapers, daily 1, weekly 3. Pop. (1880) 3,330; (1890) 6,520; (1900) 8,880.

BOONE, DANIEL: pioneer: 1735, Feb. 11—1820, Sep. 26; b. near Bristol, Bucks co., Penn. His grandfather emigrated from England 1717; and his father was born in Bucks co., but resided for a time after Daniel's birth at the headwaters of the Schuylkill, and later on the South Yadkin, in N. C. Young Daniel had very limited education, even for the place and period, learning little more than to read, write, and cipher. He was a hunter by natural instinct, and passed most of his life in hunting, trapping, and fighting Indians. He married, about 1755, Rebecca Bryan, daughter of a neighbor on the Yadkin, and remained some years in that vicinity. In 1769, he became interested in accounts which he received from John Finley, who was the first to enter the wilderness of Kentucky, and who brought back an exciting description of the natural resources of the new country. B., restless after a long period of domesticity, determined to explore the new region. He accordingly organized a company, including John Finley, John Stuart, Joseph Holden, James Monay, and William Cool, and left his home 1769, May 1, on his first exploring expedition. The party met numerous interruptions from Indians, and encountered obstacles of all sorts, some members of the company losing their lives. B. and his brother, who had joined him, returned to the Yadkin 1771, Mar., and notwithstanding the hardships they had passed through, organized a number of families determined to settle in the new country. This expedition was unsuccessful, and those of the emigrants who survived the frequent conflicts with the Indians established themselves on the Clinch river, where was now located the home of the Boone family. B. was employed by Lord Dunmore 1774 as a scout and guide; and, later, had command of a considerable body of Indian fighters. His most important act was the arranging of a treaty with the Cherokee Indians 1775, Mar. 17, by which a large tract of land was sold by a delegation of Cherokee chiefs to a number of wealthy gentlemen of the Carolinas, known as the 'Proprietors of Transylvania,' that being the name of the territory acquired, on which it was designed to

BOONE—BOONTON.

establish a republic—one of the first expressions of the rising resentment against the mother country. The land parted with by the Cherokees is thus described: 'All that tract of land beginning at the mouth, or junction of the Kentucky or Louisa river with the Ohio; thence to the source of the former; thence south, into Tennessee, until a westward line shall cross the Cumberland Mountains so as to strike the ridge which divides the waters of the Tennessee from those of the Cumberland; and with that ridge to the Ohio river; and with that river to the mouth of the Kentucky or Louisa river again.' This purchase was afterward annulled by the state of Va.: the land amounted to about half the present state of Ky. In 1775, B. made a settlement and built a fort on the banks of the Kentucky river, named by him and still known as Boonesborough. In 1780, B. brought his family to Ky., and had many narrow escapes. His brother, 'Squire' B., and one of his own sons were killed in fights with the Indians. B. lost his land when Ky. was admitted into the Union as a state 1791, Feb. 4; and he resided thereafter in Mo., where the Spaniards, who then owned that country, had given him a tract of about 8,000 acres of land. He lost this land, also, when the Louisiana purchase became the property of the United States, but congress finally granted him 850 acres. He passed the last years of his life on this property near Charrette, Mo., occupying himself with hunting and trapping. His wife died 1813.

BOONE, WILLIAM JONES, M.D., D.D.: bishop of the Prot. Episc. Church: 1811, July 1—1864, July 17; b. Walterborough, S. C. After graduating in the Coll. of South Carolina 1829, he studied law and was admitted to practice, but turned to the Episc. ministry as a profession. He entered the Virginia Theol. Sem.; and, purposing to be a missionary in heathen lands, qualified himself to be a physician, graduating M.D. in the South Carolina Med. Coll. He was ordained priest 1836, and sailed for China 1837. He was elected missionary bp. for China 1844, and the same year was consecrated in Philadelphia. He made two later visits to America, 1852 and 57, on the latter occasion remaining two years in this country. He died in Shanghai. Dr. B. translated the Prayer-book into Chinese: at the time of his death he was engaged in revising the Chinese translation of the Bible.—His son, WILLIAM JONES B., D.D. (b. Shanghai 1847), missionary bp. of Shanghai, graduated at Princeton, 1865, studied theol., was ordained priest at Hankow 1870, and consecrated bishop at Shanghai 1884.

BOONTON, *bôn'ton*: town of N. J., on the Rockaway river, in a rough mountain region, about 30 m. n.w. of New York and 9 m. n.n.e. of Morristown. It is noted for its iron works, which cover 60 acres, and in which all branches of the manufacture are carried on. The motive power is produced by the river, and the Morris canal. In old Boontown, the first nail mill in the country was built, 1770. A break in the dam across the river destroyed the old village in the early part of the 19th century. A branch of the Morris and Essex railroad furnishes railroad connections. Pop. (1900) twp. 4,710; town, 3,901.

BOONVILLE—BOORLOS.

BOONVILLE, or **BOONEVILLE**, *bôn'vil*; a city, county-seat of Cooper co., Mo., on the s. bank of the Missouri river, about 50 m. n.w. of Jefferson City, 100 m. e. of Kansas City. The distance to St. Louis by water is about 225 m. The Missouri Kansas and Texas railroad crosses the Missouri river by means of a bridge at this place, and connects with the Boonville branch of the Missouri Pacific railroad. B. is built on a bluff about 100 ft. above high water mark, and contains three banks, the Cooper Institute for women, seven periodicals of various kinds, nine churches, and various manufactories of iron, earthenware, woolen goods, etc. Coal is mined in the neighborhood. Pop. (1900) twp. 5,801, city 4,377.

BOOR, n. *bôr* [AS. *gebure*, a peasant: Dut. *boer*; Ger. *bauer*; Gael. *búr*, a boor: Dut. *bouwen*, to till]: a countryman or field-laborer; a rustic; a clown; an ill-mannered, coarse, and ignorant man. **BOOR'ISH**, a. rustic; awkward and rude in manners. **BOOR'ISHLY**, ad. *-lĭ*. **BOOR'ISHNESS**, n. coarseness of manners.

BOORGHAS': see **BURGAS**.

BOORHÁNPOOR: see **BURHAUNPUR**.

BOORLÔS, or **BOURLÔS**, *bôr'los*: the *Buticus lacus* of the ancients; a lagoon in the n. part of the Delta of the Nile, in Egypt, about five miles e. of Rosetta. It is about 50 m. in length by 25 in breadth; and generally quite shallow, being marshy in different parts. A narrow strip of land separates it from the Mediterranean, with which it communicates at the e. by a narrow strait. It is connected with the Nile by several canals. Fish are very abundant.

BOROO—BOOT.

BOORO, *bô'ro*: island of the Malay archipelago, about 60 m. w.n.w. of Amboyana, 2,000 sq.m. Though mountainous, it is very fertile. At the e. end of the island the Dutch have a station. Pop. estimated 20,000—100,000.

BOOROJIRD, or **BOOROOGIRD**, *bô-rô-jerd'*: 'town in the province of Irak-Ajemi, Persia, in a fertile valley about 190 m. n.w. of Ispahan; lat. 33° 43' n., long. 48° 45' e. It has a castle and several mosques. Pop., chiefly agricultural, abt. 12,000.

BOO'SA: see **BOUSSA**.

BOOSE, **BOUSE**, or **BOOZE**, *v. bôz* [see **BOUSE**]: to drink much with others. **BOOSY**, *a. bô'zî*, fuddled; merry. **Boos'ING**, *imp.* **BOOSED**, *pp. bôzd.*

BOOSE, *n. bôz* [AS. *bosig*; Icel. *bás*, a stall]: in *old* and *prov. Eng.*, a stall for cattle. **Boosy**, *n. bô'zî*, the trough out of which cattle feed. **BOOSY PASTURE**, the pasture adjoining the cattle-stall.

BOOT, *v. bôt* [AS. *bôt*; Goth. *bota*, advantage, good: AS. *botan*, to pay the price of; Icel. *bôt*, advantage: Dut. *boete*, fine, forfeit]: to give advantage to; to profit; to do good; to enrich: *N.* profit; gain; advantage. **To BOOT**, *ad.* into the bargain. **BOOT'LESS**, *a.* without advantage; not contributing to further the end in view. **BOOT'LESSLY**, *ad. -lî*. **BOOT'LESSNESS**, *n.* the state of being fruitless. **BOOTLESS ERRAND**, an errand fruitless, or by which nothing was gained.

BOOT, *n. bôt* [F. *botte*, a boot: Dut. *bote*—same as Irish *brogue*; Sp. *bota*; It. *botta*, a hollow skin]: a covering of skin or leather for the feet, ankles, and part of the leg; a box for luggage in the fore part of a coach; an instrument of torture for compressing the leg: *V.* to put on boots; to make ready for riding. **BOOT'ING**, *imp.* **BOOT'ED**, *pp.* **BOOT-CRIMP**, a tool or a machine for giving the shape to the pieces of leather designed for boot uppers. **BOOT-HOSE**, stockings to serve for boots; splatterdashes. **BOOT'JACK**, *n.* an article for taking off boots. **BOOT-TREE**, a boot-last; a block on which boots are stretched. **BOOTEE**, *n. bô-tê'*, a short or half boot. **BOOTS**, *n. plu. bôts*, an under-servant in a hotel or inn, whose duty it is to clean the boots of travellers; in *familiar slang*, a term for the youngest officer at a regimental mess. **BOOT-TOPPING**, scraping off the adhering matter from a ship's bottom, and then daubing it with tallow. **BOOT AND SADDLE**, the trumpet-call which precedes the march of cavalry.

BOOT, or **Boots**, or **BOOT'IKIN**: instrument of judicial torture, formerly used in Scotland to force confessions from persons accused of crimes, or answers from unwilling or suspected witnesses. Bp. Burnet in the *History of his Own Time*, and Sir Walter Scott in his *Old Mortality*, speak of the B. as made of iron; but the Rev. Thomas Morer in his *Short Account of Scotland*, written from personal observation of the country when the B. was still in use, describes it as 'made of four pieces of narrow boards nailed together, of a competent length for the leg, not unlike those short

cases we use to guard young trees from the rabbits.' One or both legs of the person to be tortured having been placed in this case, wedges were inserted between the limb and the sides of the case, and these wedges were driven down by the executioner with a mall or hammer, questions being at intervals put to the sufferer, until either he gave the desired information, or fainted away, or showed such endurance as satisfied the judges that no answer could be extorted from him. The wedges were commonly placed against the calf of the leg, but Bp. Burnet says he had heard that they were sometimes placed against the shin-bone. In one case—that of a lad in Orkney, 1596—it is recorded that they were struck home as many as 57 times. In another—that of John Fian, schoolmaster at Prestonpans, burned for sorcery 1591—it is said that the victim 'did abide so many blows, that his legs were crushed and beaten together as small as might be, and the bones and flesh so bruised that the blood and marrow spouted forth in great abundance, whereby they were made unserviceable for ever.' 'Still,' it is added, 'he would not confess;' and, indeed, it is remarkable in how many cases we are told that the torture, agonizing as it was, failed in its purpose, even where the sufferer 'shrieked for pain in terrible manner, so as to have moved a heart of stone.' A writer of 1591, after speaking of the 'pilniewinks,' 'pilliwinks,' thumb-screws, or thumbikins (q.v.) as 'a grievous torture,' and of compression of the skull by a twisted cord as 'a most cruel torment also,' describes the B. as 'the most severe and cruel pain in the world.' Yet there are instances in which it was not thought enough. When the boots were first used in Scotland is not known. In a case where a deed of conveyance of land was challenged as a forgery, 1579, two witnesses, a clergyman and a notary, both of Forfarshire, were ordered to be 'put in the boots, gins, or any other torments, to urge them to declare the truth.' In a letter, still preserved in the State Paper Office at London, Sir Francis Walsingham writes to the English ambassador at Edinburgh, in 1583, that Queen Elizabeth desires that Father William Holt, an English Jesuit then in Scotland, may be 'put to the boots.' The B. was subject of allusion on the English stage in 1604; in Marston's *Malcontent*, printed in that year, one of the characters is made to say: 'All your emperics could never do the like cure upon the gout the rack did in England, or your Scotch boots.' A young gentlewoman of Aberdeenshire was tortured by the B. in 1630. Soon afterward, it is said to have fallen into desuetude for about 30 years. It was revived after the insurrection of the westland Covenanters 1666, and continued to be used through the reigns of King Charles II., and King James II., and during the first years of King William III. 'The genius of our nation,' writes Sir. J. Lauder of Fountainhall, 1681, 'looks upon the torture of the boots as a barbarous remedy and yet of late it hath been frequently used among us.' The Claim of Right brought forward by the Scottish Convention 1689, denounced 'the use of torture, without evidence, and

BOOTAN—BOOTH.

in ordinary crimes, as contrary to law.' Notwithstanding this declaration, the B. was used at least once again. In 1690, Neville Payne, an English gentleman who was supposed to have entered Scotland on a treasonable mission, was put to the torture under a warrant subscribed by King William, and still shown in the Register House at Edinburgh. The B. was applied to one leg, the thumb-screws to both hands, but without any effect, although, in the words of one of the privy-councillors, the torture, which lasted two hours, was inflicted 'with all the severity that was consistent with humanity, even unto that pitch that we could not preserve life and have gone farther.' This is believed to be the last time that the B. was used. But it was not until Scotland had ceased to be an independent kingdom, that the British parliament enacted—by the statute 7 Anne c. 21—that in future 'no person accused of any crime in Scotland shall be subject or liable to any torture.' Torture is believed not to have been used in England after 1640. It was abolished in France 1789, and in Russia 1801.

BOO'TAN: see BHOTAN.

BOOTES, n. *bō-ō'tēz* [Gr. *boōtes*, a plowman]: the constellation following the Great Bear; in ancient mythology, the son of Ceres and Iasion; who, being plundered of all his possessions by his brother Pluto, invented the plow, to which he yoked two oxen, and cultivated the soil to procure subsistence for himself. As a reward for this discovery, he was translated to heaven by his mother with the plow and yoke of oxen, under the name of B., i.e., the Ox-driver, still borne by one of the constellations. According to others, B. was son of Lycaon and Callisto, whom his father slew, and set before Jupiter for a repast, to try his omniscience. Jupiter restored him to life, and placed him among the stars.

BOOTH, n. *bóth* [Gael. *both* or *bothan*, a cottage or hut: Icel. *buth*, a hut: W. *broth*, a hut, a booth: Dut. *boord*]: a house or shed built of light materials, as wood or boughs of trees; a stall at a fair. BOOTHY or BOTHY, n. *bóthi*, in many parts of Scotland, a hut built of whatever materials are nearest at hand—wood, turf, or stone—for the accommodation of unmarried farm-servants; a cottage or house for the lodging of unmarried farm-servants.

Throughout Europe, in early times, trade was carried on chiefly by fairs, as it still is in some parts of it, and in many parts of Asia. The tents, huts, or other temporary or movable structures in which the traders exposed their goods for sale, were called *booths*. Though the corresponding German *bude* is generally referred to *bauen*, to build, the English *booth* is traced by some to the Gaelic *both* or *bothag*, a bothy or hut; by others to the Greek *apothēke*, through the Latin *apotheca*, the Italian *boteca*, and the French *boutique*—all signifying an office, shop, store-house, or tavern. From this, its primary sense, B. gradually came to mean a fixed shop or warehouse. As towns sprang up, the yearly fair was more or less supplanted by the weekly

BOOTH.

market. The slight B. set up in the same spot every week. had a tendency to become substantial and permanent; and the records of the 12th and following centuries are full of unavailing complaints against the encroachments in this way upon the market places and streets. Thus, Joceline of Brakelond chronicles the ineffectual efforts of his great and wealthy abbey, 1192, to dislodge the burgesses of Bury St. Edmunds from the shops, sheds, and stalls which they had erected on the market-place without leave of the monks. So in the *Winton Domesday Book*, compiled 1148, notice is taken of 'houses' in Winchester which had been 'stalls.' So, also, Stow relates that the houses in Old



Merchants' Booths:

From an illuminated MS. representing Venice in the 14th century.

Fish Street, in London, 'were at the first but movable boards set out on market-days to show their fish there to be sold; but procuring license to set up sheds, they grew to shops, and by little and little, to tall houses.' So, again, the same chronicler tells us that 'in Cheapside, from the great conduit west, were many fair and large houses, which houses in former times were but sheds or shops, with solars (lofts or upper chambers) over them.' So in Edinburgh the range called at first 'the Boothraw,' and afterward 'the Luckenbooths,' arose in the very centre of the High Street. So, likewise, in Edinburgh and elsewhere, the trader who for years had spread his stall under the shelter of the same buttress of the church or town-hall, began to rest a fixed wooden B. against it, gradually transforming the timber beams into lath and plaster, or even into brick or stone, until at length the basement of the stately cathedral, or *hôtel de ville*, was incrustured all over with unseemly little booths (or *krames*, as they were called in Scotland), like limpets on a rock. For booths used in England for theatrical representations, see THEATERS, LAWS AS TO.

BOOTH, *bôth*, EDWIN: actor: 1833, Nov. 13—1893, June 7; b. Bel Air, Md.; son of Junius Brutus B. He had a limited private school education; was his father's traveling com-

BOOTH.

panion at an early age; and under his father's instruction and encouragement made his first public appearance on the stage as Tressel in *Richard III.* at the Boston Museum, 1849, Sep. 10. During the season 1849-50 he appeared as Cassio in *Othello* and Wilford in *The Iron Chest* in Providence, Philadelphia, and elsewhere; 1850, Sep., made his first appearance in New York; and 1851 assumed for the first time and without an hour's preparation, on his father's sudden illness, the principal part in *Richard III.* He played with his father and elder brother in San Francisco 1852; made a tour of Australia and the Sandwich Islands 1854-56; appeared in Boston as Sir Giles Overreach 1857; made his first star appearance in New York the same year; made his first professional trip to Europe 1860-62; and became manager of the Winter Garden Theater, New York, 1862. The assassination of Pres. Lincoln by his brother, John Wilkes B. (q.v.), was a crushing blow to him. He immediately issued a patriotic and tender address to the American people, deploring the crime, avowing his own loyalty to the Union, and announcing his permanent retirement from the stage; but was induced to reconsider his determination and reappear 1866, Jan. 3, as Hamlet at the Winter Garden Theater. 1869, Feb. 3, he opened the theater bearing his name in New York, and managed it till 1874, when he became bankrupt. In 1876 he made a tour of the United States; 1881, Jan., began an engagement in London, in which he alternated with Henry Irving (q.v.) in the characters of *Othello* and *Iago*; 1881 Oct. 3—1882, Apr. 29, played in leading American cities; 1882 made his third season in England and his first in Germany; 1884-87, starred in the United States; 1887-8, played alternating parts with Lawrence Barrett; and, 1888, presented to the Players' Club of New York a completely furnished house on Gramercy Park. —Edwin Booth died after a prolonged illness in his rooms at the Players' Club. His place in the history of the American stage is with difficulty to be described. Except perhaps Edwin Forrest, he was the most cultured actor of his time, with singular refinement and spiritual charm. His acting was the expression of his delicate, sensitive, thoughtful nature, and he was equally admired on the stage and esteemed and loved as a man. Gifted with remarkable intellectual power, and thoroughly skilled in his work as an artist, there were certain characters in which he might be compared unfavorably with other actors, but there were other characters in which he was supreme, e.g., *Iago*, Sir Giles Overreach, Hamlet, Richard III., and Petruccio in *The Fool's Revenge*.—See William Winter's *Life*, etc.

BOOTH, HENRY MATTHIAS, D.D.: Presbyterian clergyman: 1843, Oct. 3—1999, Mar. 18; b. New York. He received his early education in New York, and entered Williams Coll., graduating 1864. He graduated from Union Theol. Sem., New York, 1867; and immediately accepted a call to the Presb. chh., Englewood, N. J., where he remained 24 years. The church under his pastorate had great prosperity. He spent part of 1891 in Europe, and in the

BOOTH.

winter of 1892 preached in the Brick Presb. Chh., New York. In the spring of 1893 he was elected pres. of the Presb. Theol. Sem., Auburn, N. Y., with which office is combined the professorship of practical theology. Dr. B. published *The Heavenly Vision* (1885); *Sunrise, Noonday, and Sunset of the Day of Grace* (1880); *The First Communion* (1894).

BOOTH, JAMES CURTIS: LL.D.: chemist: 1810, July 28—1888, Mar. 21; b. Philadelphia. He graduated at the Univ. of Pennsylvania, 1829, and studied at the Rensselaer Polytechnic Inst., Troy, N. Y. He was in Europe 1832–35 studying chemistry; and, established in Philadelphia 1836 the first chem. laboratory in the United States for the study of applied chemistry. He was prof. of applied chemistry in the Franklin Inst. from 1836. In 1849, he was appointed melter and refiner in the U. S. mint in Philadelphia. B. published (besides many articles and monographs on chem.) *Encyclopædia of Chemistry* (1850); etc.

BOOTH, *bôth*, JOHN WILKES: 1839–1865, Apr. 26; b. Baltimore: actor. He was the assassin of Pres. Lincoln. The son of the English actor Junius Brutus B., he had more than ordinary power on the stage. In conspiracy with others, he shot the president in his private box at Ford's Theatre, on Good Friday night 1865, Apr. 14. Rushing to the front, he exclaimed: '*Sic semper tyrannis!* The South is avenged,' and, leaping down upon the stage, made his escape. In his descent he broke his leg; but by the aid of an accomplice he rode 30 miles without resting. When overtaken by his pursuers, in a barn near Bowling Green, he refused to surrender, and was shot. The disposition of his body has never been publicly known.

BOOTH, JUNIUS BRUTUS: actor: 1796, May 1—1852, Nov. 3; b. London, d. on a Mississippi boat for lack of medical care; son of Richard B., a lawyer, and related on his mother's side to John Wilkes, the English statesman. B. was classically educated, tried painting, sculpture, poetry, worked for a time in his father's office, then got commission as midshipman and resigned because unwilling to serve against the United States. He appeared as amateur in a London theatre, then became a professional actor, and, 1814, made a professional tour through Holland and Belgium. As substitute for Edmund Kean one night in 1815, he captivated an audience at Worthing. B., as a rival of Kean, had, 1817, a misunderstanding with him, which was the occasion of a riot, when B. appeared at Covent Garden. After continued successes he performed with Kean 1820. He married Mary Anne Holmes 1821, Jan. 18, arrived with her at Norfolk, Va., 1821, June 30, and from that time till his death played in the chief cities of the country, gaining high esteem as an actor. His parts were Richard III., Shylock, Othello, Iago, Lear, Hamlet, Sir Giles Overreach, etc. In New Orleans he took parts in French as well as English. He managed Camp Street Theatre, New Orleans, 1828, Adelphi Theatre, Baltimore, 1831. He visited Europe 1825 and 1836. B. bought, 1822, a place in the woods in Harford co., Md., 25 m. from Baltimore, to which his father came to live;

BOOTH

there also B. retired when not engaged, but for the last 10 years of his life Baltimore was his retreat. After 1832 he suffered from attacks of insanity aggravated by intemperance. He had several children.

BOOTH, MARY LOUISE: author: 1831 Apr. 19—1889, Mar. 5; b. Yaphank, N. Y. She was precocious, and at the age of 14 taught in her father's school at Williamsburg, L. I., and began translating from the French, and was engaged in general literary pursuits, and had made a reputation before she was 25 years old. She published Victor Cousin's *Secret History of the French Court; or, Life and Times of Mme. de Chercuse* (1859); and in the same year her *History of the City of New York*; which in later editions became a standard authority. During the civil war, she translated from Gasparin Laboulaye, and other eminent French writers, their monographs on topics connected with that subject, furnishing most important material for future American historians of that period. Her *Results of Slavery* (1862) was highly commended by Lincoln, Sumner, and other statesmen. Her translations from Martin, Laboulaye, and other distinguished French authors brought her great repute. From 1867-89 she was editor of *Harper's Bazaar*.

BOOTH, WILLIAM, known as GENERAL BOOTH: founder of the Salvation Army: b. Nottingham, England, 1829, Apr. 6. At 15 yrs. of age he left the Established Chh.; at 17 became a lay preacher; at 24 left the Wesleyan Society and joined the Meth. New Connection, having already preached 18 months in London; but, 1865, he independently established in the East End of London the Christian Mission, out of which grew the Salvation Army (q.v.), which took this name 1878, and is now organized in 32 countries and colonies, with 10,000 officers, and has an income from all sources, including publications, of \$3,750,000. B. is the head of the organization, which must unquestioningly obey him. He is the author of its Orders and Regulations and of *In Darkest England* (1890), with other publications—partly in conjunction with the late Mrs. Booth. He has repeatedly visited the United States and other lands in the course of his laborious work, the sphere of which is among the poor and the outcast, for whom he has devised various schemes of practical help. His work has received the aid of many persons of prominence in different countries, and by general consent he is a man of sincerity and great ability.—Mrs. CATHERINE BOOTH, wife of William: 1829, Jan. 7—1890, Oct. 4; b. in Ashbourne, Derbyshire; d. London: a woman of superior power and devotion, known as the 'Mother of the Salvation Army.' Soon after marriage, she began to preach, and, when the Meth. New Connection declined to reappoint her husband to evangelistic work, she travelled with him as a fellow-evangelist, helped to found the London mission, and was accustomed to conduct services anywhere on occasion. To her influence is attributed much of the total-abstinence principle adopted by the movement, and the simplicity of dress of the women en-

BOOTH.

listed. Her judgment and her zeal are traceable also in its organization and administration. Among her works are *Aggressive Christianity* and *The Salvation Army in Relation to Church and State*. She prepared a volume of *Reminiscences*. An immense concourse of followers and of the grateful poor gathered to witness her funeral.—WILLIAM BRAMWELL B., eldest son of William and Catherine B. (b. about 1856), has been the active 'chief of staff' of his father, and is regarded as his chosen successor.—BALLINGTON B., second son, entitled Marshal, married a lady of good family and fortune; became supt. of the Australian missions 1884, and afterward took charge of the work in the United States: see VOLUNTEERS, AMERICAN. His wife, MAUD (CHARLESWORTH) B., was efficient in the Salvation Army.—A third son, HERBERT B., commands the men's dept. of the Training School, as a daughter, EMMA B., does the women's dept.—There are nine children.—*In Darkest England, and the Way Out*, gives statistics of vice and poverty in Great Britain, such as, in London, 51,000 inmates of workhouses and charitable institutions; 33,000 homeless; 300,000 living on between 18s. (\$4.50) a week and starvation; 220,000 on 18 to 20s. intermittently; 387,000, the same regularly; total 993,000. On this basis, Gen. B. reckons a total in the United Kingdom of 165,000 idlers and criminals; 1,550,000 who fluctuate between casual earnings and want; 1,905,500 houseless or in workhouses and asylums. Including those in penal institutions and reformatories, he sums up three millions of paupers and the abandoned. The remedy he proposes is threefold: a city colony that shall collect the outcasts, and give work, though of the simplest kind, such as collecting waste material, and shall give shelter and food, with factory employment as the work advances. From this organization is to be recruited suitable material for a country colony, where farming and gardening will be pursued, with any other industries, ultimating in co-operative villages. Again, from this are to be selected persons adapted to some foreign colonies on a larger scale. There are many details proposed—e.g., provision for the sick, for reformatories, for savings banks, etc. The colonies, it is suggested would grow up naturally, as in the far west, the people putting up the buildings and making the needed improvements. The book has met with the approbation of some eminent prelates and statesmen; and it has been criticised as not original in its conceptions, the plan having been essentially anticipated by Count Rumford, an American, 100 years ago, and the labor-colony idea being now in successful operation in Germany; to this success, Lord Meath appeals in defense of Gen. B., saying that the system has rapidly advanced there since 1882, with most gratifying results, the colonies numbering 22 in the country, besides one in Berlin and another in Magdeburg—a special feature of which is the earning of good clothes, tools, and some money, with which a man can go forth and readily find work. Prof. Hux-

BOOTHAUK—BOOTS.

ley, on the other hand, points to the dire example of religious enthusiasm in the well-intentioned founder of Jesuitism, and a somewhat similar implicit obedience to a superior required in the Salvation Army, and, referring to the already large numbers and resources of the army, asks: 'Who is to say that the Salvation Army, in the year 1920, shall not be a replica of what the Franciscan order had become in the year 1260?' There certainly does not appear to be thus far a very striking likeness between the mixture of piety and jollity, the disregard of 'the church,' the charitable aims, the popular massing, of the Salvation Army, and the extreme secrecy, asceticism, and churchliness of Ignatius Loyola. Accordingly, it is not strange that the Marquis of Queensbury, a professed agnostic like Prof. Huxley, has contributed £100 to Gen. B.'s scheme. The Earl of Derby has subscribed £1,000, others liberal sums, and Archdeacon Farrar preached a sermon in Westminster Abbey, making a fervent appeal in behalf of the plan. Letters of approval have been received from the bishops of Bath, Wells, and Rochester. Gen. B. has published a letter of thanks, suggesting collections.—See SALVATION ARMY.

BOOTHAUK, *bó t'hawk'*: fortified pass of Afghanistan, 12 m. e. of Cabul. It is a passage for 5 m. between cliffs 500 ft. high, and in some places only 50 yards wide.

BOOTHBAY, n. *bóth'bā*: town on the Atlantic coast in Lincoln co., Me., 13 m. s.e. of Bath. It has a good harbor open all winter, and is mainly engaged in trade and fisheries. B., which is a summer resort, has two fine hotels, a bank, newspaper office, etc. Pop. including the township (1880) 3,575; (1890) 3,417.

BOOTHIA FELIX, *bó'thī-a fē'lik's*: peninsula, forming the most northerly part of the American continent. Toward the s., it is terminated by an isthmus, while, to the n., it is bounded by Bellot Strait (q.v.). It was discovered by Sir John Ross during the most famous of his voyages, and named after his friend Sir Felix Booth (1775–1850) who had given £20,000 to assist the polar expedition. At the time it was supposed to reach as far n. as Barrow Strait.

BOOTHIA GULF: separating Boothia Felix on the w. from Cockburn Island on the e.; is a southward continuation of Prince Regent's Inlet.

BOO'TON: island near the s.e. of Celebes, between 4° 25'—5° 45' s. lat., and in 123° 4' e. long; 1,807 m. It is mountainous and thickly wooded, produces fine timber, rice, maize, sago, etc. There are buffalo, swine, horses, and goats. The people are Malays. The chief town, Booton, is walled, and there fine cottons and other stuffs are made. The sultan is in alliance with the Dutch. Pop. 17,000.

BOOTS: leather coverings for the legs and feet, a lengthened variety of shoes; among the most ancient articles of attire. Shoes, extended a certain height up the leg, laced, ornamented, and of fanciful colors, were in use by the ancient Egyptians, Greeks, and Romans, as is seen by existing relics and drawings. For these and other varieties of shoes,

BOOTS.

also for the trade and manufacture of shoes and boots generally, see SHOE-TRADE. Different kinds of half-boots were worn by the Anglo-Saxons and Anglo-Normans; and in the reign of Edward IV., if not earlier, the boot-proper with tops and spurs, was established as an article of knightly dress. (See *Book of the Feet*, by J. Sparkes Hall, London.)



Jack-Boot.

In the reign of Charles I., a species of boot, exceedingly wide at the top, made of Spanish leather, came into use; and with Charles II, the highly decorated French boot was introduced as an article of gay courtly attire. Meanwhile, the jack-boot, as it is called (see JACK), had become indispensable in the costume of cavalry soldiers and horsemen generally; and by William III. and his followers it was regularly naturalized in England. Strongly made, the jack-boot extended in length above the knee, was capacious at top, had a very high heel, and round the ankle, it had a flat leather band bearing a powerful spur. In the adjoining cut is offered a representation of this highly characteristic boot, which we readily associate with the civil and foreign wars that distracted the 17th c. This huge species of boot remained in use in British cavalry regiments until comparatively recent times, and was dismissed as too cumbersome for men dismounted. It is, nevertheless, in a somewhat improved form, still worn by the Horse-guards.

As an improved jack, the Horse-guards boot bears a remarkably close resemblance to the boot of the French postilion, well known to the older class of continental tourists. French postilion B., however, are made of that capacity that will suit any ordinary foot and leg. Kept economically as part of the equipment of a posting-house, they are ready for all legs, with or without stockings, as the case may be; and looking at the strength of their materials, they may very fairly be supposed to accommodate all the post-boys of an establishment during half a century.

The jack-boot is almost entitled to be called the parent of the top boot and some other varieties. B. with tops of a yellow color were so commonly worn by gentlemen in the 18th c., as to become a peculiarity in the national costume of the English. When Philip, Duke of Orleans, and other revolutionists of note, affected to imitate the sentiments and manners of the English, they ostentatiously wore top-boots. In the early years of the present c., a number of members of the house of commons, among whom may be specified the late Sir Francis Burdett, habitually wore top-boots; nor have they yet entirely disappeared. By jockeys and fox-hunters, they are likely to remain in permanent use. What perhaps contributed to the general disuse of top-boots, was the introduction of the Hessian boot as an article of walking-dress. Worn over tight pantaloons, the Hessian boot was a handsome piece of attire, giving, undoubtedly,



Hessian Boot.

an elegant appearance to the nether costume. A representation of a Hessian boot, with its tassel, is annexed. B. of this shape, as is seen by engravings, were worn by English general officers in the early part of the French war, and somewhat later. At length they were superseded by the well-known Wellington boot, which, as its name imports, was introduced by the great duke, as a simplification, under the loose military trouser. This species of boot has, in its turn, been almost entirely abandoned in England, in consequence of the universal use of short ankle B.; but in the United States it is still generally used by tillers of the soil, and by some other classes of workmen.

BOOTY, n. *bō'tī* [Sw. *byte*, exchange, barter—from *byta*, to exchange or divide: Dan. *bytte*, spoil: F. *butin*; It. *bottino*, plunder: Ger. *beute*, booty: Gael. *buaidh*, conquest]. spoil gained from the enemy; plunder; pillage: it is the victor's share in property captured from the vanquished. It is generally a military term, the word *prize* being more frequently used in the navy. Prize and B. originally belonged to the sovereign, and are only distributed to the captors as an act of grace; for if the sovereign (in the United States, the govt.) pleases, the property can be given back again to the enemy. See **PRIZE**. **FREEBOOTER**, n. *frē'bōt-ēr* [*free*, and *booty*]: one who makes war for plunder only.—**SYN.** of 'booty': pillage; plunder; rapine; spoil; prey.

BOOZE: see **BOOSE** 1.

BO-PEEP, n. *bō'pēp* [see **BOGLE**]: a child's play of looking from a place of concealment and drawing back the face again.

BOPP, *bōp*, **FRANZ**: 1791, Sep. 14—1867; b. Mainz: ordinary prof. of oriental languages, at Berlin Univ. Devoting himself exclusively to the study of oriental literature, he spent some years in Paris, where he was encouraged in his labors by Chezy, Silvestre de Sacy, and August Wilhelm Schlegel, and afterward visited London, to prosecute his favorite studies more thoroughly, being partly supported by a small pension from the king of Bavaria. His first publication was on the Sanskrit verb; he afterward produced a Sanskrit Grammar, a *Glossarium Sanscritum*, and editions of several fragments of the great Indian epic, the *Mahabharata*, in the original text, with a translation. He greatly facilitated the study of Sanskrit in Europe. But his most important labors centred in the analysis of the grammatical forms of the different languages of the Indo-Germanic family, by which he may be said to have founded a new science of Comparative Grammar. His great work in this department is a Comparative Grammar of the Sanskrit, Zend, Greek, Latin, Lithuanian, Old Slavonian, Gothic, and German (*Vergleichende Grammatik*, etc., Berl. 1833, etc., second ed., entirely recast, 1857). An English translation by Lieut. Eastwick, conducted through the press by Mr. Wilson, Boden prof. of Sanskrit in Oxford Univ., was published in 3 vols 1845-50. In recognition of his splendid services to philology, he was, 1842, made a

BOPPARD—BORACHIO.

knight of the newly erected French *Ordre du Mérite*, and in 1857, foreign associate of the French Institute.

BOPPARD, or **BOPPART**, *böp'párt* (ancient *Baudobriga*): walled town of Rhenish Prussia, on the left bank of the Rhine, about 9 m. s. of Coblenz. B. is a very ancient place, with dark, narrow streets, and is built chiefly of wood. Its appearance, however, is picturesque, and it has several buildings, architecturally remarkable. The church of the Carmelites contains some fine specimens of 16th c. sculpture. During the middle ages, B. was an imperial city, and many councils were held in it. Remains of the Roman fortress built by Drusus are still seen. Near B. is Marienberg, the famous hydropathic resort. Pop. (1880) 5,524. (1885) 5,594.

BORA, n. *bō'rǎ* [L. *bōrēās*, the mountain or north wind]: a wind which descends from the Julian Alps, and sweeps over the Adriatic Sea—a bitterly cold, tempestuous wind.

BORA, *borá*, **KATHARINA VON**, or **CATHARINE DE BORA**, wife of Martin Luther: 1499, Jan. 29—1552, Dec. 20; b., it is supposed, at Löben, near Schweinitz, Saxony. At a very early age, she entered the Cistercian convent of Nimptschen, near Grimma. Becoming acquainted with Luther's doctrines, she found herself very unhappy in her monastic life; and finally, with eight other nuns, whose relatives, like her own, refused to listen to them, she applied for assistance to Luther. Luther obtained the services of Leonhard Koppe, a citizen of Torgau, and by him and a few associates the nine nuns were liberated from the convent, 1523, Apr. They were brought to Wittenberg, where Luther had suitably provided for their reception. Catharine became an inmate in the house of the burgo-master Reichenbach. Luther, through his friend, Nicholas von Amsdorf, minister in Wittenberg, offered her the hand of Doctor Kaspar Glaz, who became pastor in Orlamünde. She declined this proposal, but declared herself ready to marry Von Amsdorf, or Luther himself, who had already laid aside his monastic dress. Her marriage with Luther took place 1525, June 13, and was made the occasion of much reproach by his enemies, which, though without foundation, has not ceased to be repeated to this day. In his will, he left her all that he had, so long as she should remain a widow, because, as he says, she had always been an affectionate and true wife to him. After Luther's death, the Elector of Saxony and Christian III. of Denmark contributed from time to time to her support. She died at Torgau.

BORACHIO, n. *bō-räch'ĭ-ō* [Sp. *borracha*, a bottle, usually of a pig's skin, with the hair inside, dressed with resin and pitch, to keep wine or liquor sweet: compare Gael. *borracha*, a bladder—from *borra*, to swell]: a bottle or cask; a drunkard.

BORACIC—BORAGE.

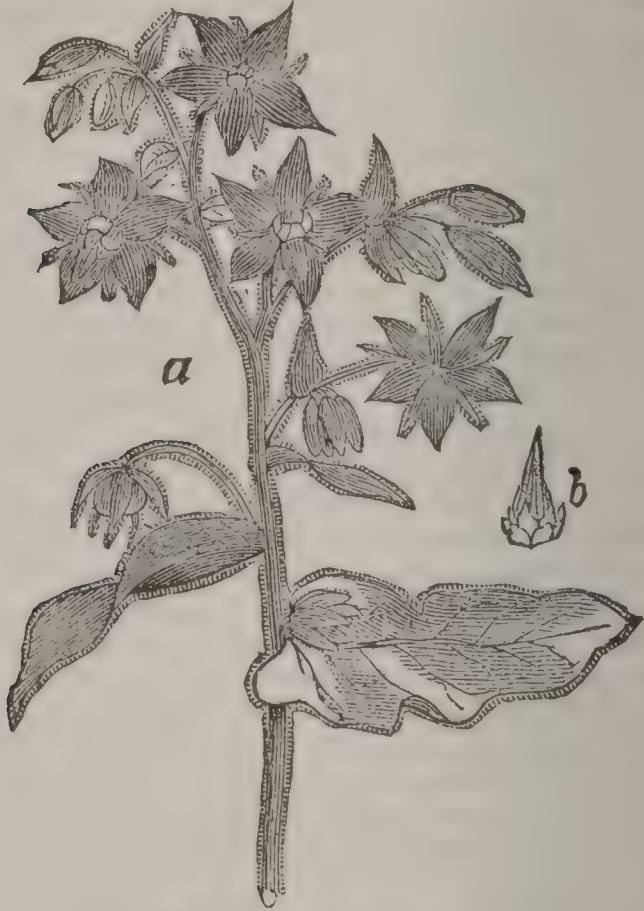
BORACIC, a. *bō-rās'ik* [see **BORAX**]: of or from borax. **BORACIC ACID**, a white solid substance, a compound of boron and oxygen. **BORACITE**, n. *bōr'ā-sīt*, an anhydrous mixture of borate and chloride of magnesium. **BORATE**, n. *bō'rāt*, a salt of boracic acid.

BORACIC ACID, or **BORIC ACID**: compound of boron, hydrogen, and oxygen, $B(OH)_3$, or $3H_2O, B_2O_3$; found in solution in the hot lagoons of Tuscany, which yield a large supply of it. It is easily prepared by decomposing with sulphuric acid a hot solution of Borax (q.v.), which is a borate of sodium, abundant in the salt lakes of the United States, India, Thibet, and other parts of Asia. B. A. is made from the borax of Borax Lake, in Cal., by decomposing it with hydrochloric acid. B. A. crystallizes in transparent six-sided plates, soluble in abt. 25 parts of cold water; much more soluble in boiling water. It has but little taste, and differs considerably from the stronger acids in its action on vegetal colors, imparting to blue litmus paper only a wine-red color, like that produced by carbonic acid; and to tumeric paper a brown color, like that produced by alkalies, but easily distinguished therefrom by the fact of its not disappearing on the addition of an acid. The crystallized acid, when heated, gives up water and melts with great tumefaction to a glassy transparent mass of boric oxide, B_2O_3 , which readily dissolves many metallic oxides, with very characteristic colors, e.g., deep blue with oxide of cobalt, amethyst with manganese, bright green with chromium. The crystallized acid dissolves in alcohol, and the solution burns with a green flame.—B. A. is used in the arts as a flux, as an ingredient in the glaze employed in pottery, and the wicks of stearine and composite candles are treated with it, so that when the candle is burning, the end of the wick, as it lengthens, may fuse and fall to the side, where it can be burned away. As an antiseptic and preservative of food, B. A. is used more than any other antiseptic—either alone or with borax—in preserving butter, milk, wine, beer, meat, and fish. Its desirableness for this use is still much discussed, but as yet there is no authentic evidence of evil results from it. In surgery B. A. is extensively used as an antiseptic. The powder is used dusted on ulcerating surfaces, and on fresh wounds, to prevent supuration. Aurists blow it into the cavity of the middle ear to check the formation of pus. Dissolved in water, it is one of the most frequent lotions prescribed by the oculist, in cases of catarrhal inflammation of the eyes, being very bland and unirritating. *Boro-glyceride*, prepared by heating B. A. with glycerine, has very valuable antiseptic properties.

BORAGE, n. *bō'rāj* [F. *bourrache*, borage—from It. *borragine*—from mid. L. *borrag'inem*—from *borra* or *burra*, rough hair], (*Borāgo*): genus of plants of nat. ord. *Boraginæ* (q.v.); having a wheel-shaped corolla, the mouth of which is closed with five teeth, and forked filaments, of which the inner arm bears the anther, the anthers connivent

BORAGE.

around the style, in the form of a cone. The species are few, chiefly natives of the countries around the Mediterranean Sea. The COMMON BORAGE (*B. officinalis*) is found in waste places in many parts of Europe, and is frequent—perhaps naturalized—in Britain. It is a plant of rather coarse appearance, with a stout erect herbaceous stem, 1–2 ft. high, somewhat branched; the lower leaves elliptical, obtuse, tapering to the base; the stem, leaves, flower-stalks, and calyx rough with hairs. The flowers are more than half an inch broad, of a beautiful blue color. *B.* was formerly much cultivated and highly esteemed, being reckoned among the *cordial* flowers, and supposed to possess exhilarating qualities, for which it no longer receives



Borage (*B. officinalis*):
a flowering branch; *b*, the cone of stamens, etc.

credit The belief in its virtues was at one time extremely prevalent in England, and its use universal. The flowers were put into salads, Gerarde tells us (1597), ‘to make the mind glad;’ and he adds: ‘There be also many things made of them, used everywhere for the comfort of the heart, for the driving away of sorrow, and increasing the joy of the mind.’ Like some other plants of the same order, *B.* contains nitrate of potash (nitre), and is slightly febrifuge. It is mucilaginous and emollient, and has been used in pectoral affections: its leaves impart a coolness to beverages in which they are steeped; and with wine, water, lemon, and sugar, enter into the composition of an English drink called a *cool tankard*. The young leaves and tender tops are pickled, and occasionally boiled for table.

BORAGINEÆ—BORAX.

BORAGINEÆ, or **BORAGINACEÆ**, *bō-rāj-ĭ-nā'sē-ē*: natural order of dicotyledonous plants, chiefly herbaceous, but also containing shrubs and even trees; the leaves generally rough with hairs which proceed from a thick hard base, and the whole plant mucilaginous and emollient. The leaves are alternate and without stipules. The flowers are in spikes, racemes, or panicles which are almost always coiled up, and gradually uncoil and elongate themselves, the flowers expanding in succession. The calyx is 4-5-partite, and remains till the fruit is ripe, the corolla is generally regular, 4-5-cleft, imbricated in bud; the stamens rise from the corolla, and are equal in number to its divisions—generally five—and alternate with them. The ovary is 4-partite, 4-celled; the style simple, arising from the base of the lobes of the ovary. The fruit consists of 4—or sometimes of 2—distinct achenia: see **ACHENE**.—The order *Ehretiaceæ* of some botanists differs chiefly in the fruit, which in the more typical species is a succulent drupe; and in the *Heliotropes* consists of four dry achenia more or less consolidated.—There are about 600 known species of the proper *Boragineæ*, and about 300 of *Ehretiaceæ*. The former are natives principally of temperate climates, and are particularly abundant in the s. of Europe and in the temperate parts of Asia; the latter are more tropical, but not exclusively so. **BORAGE** (q.v.), **ALKANET** (q.v.), **COMFREY** (q.v.), and **FORGET-ME-NOT** (q.v.), are familiar examples of the former. There are many species in N. America including, besides the above, *Blueweed*, *Bugloss*, and the beautiful *Lungwort* (*Mertensia Virginica*).

BORAK, n. *bō'rāk*: see **AL-BORAK**.

BORAS'SUS: see **PALMYRA PALM**.

BORAX, n. *bō'rāks*, or **BIBORATE OF SODA** [Ar. *baurac* or *būraq*, a species of nitre; F. *borax*; Sp. *borrax*]: saline incrustation found native on the shores of some lakes in Persia, Thibet, Nevada, and California; also occurring widely scattered over the world. Till comparatively recent years, the main source was the crude article brought from Thibet in skins, and called *tincal*. In 1856 the California sources of B. were discovered; the bottom of a lake being found covered to a depth of abt. 18 inches with a mud impregnated with B., and containing large crystals of it. From this mud, by treatment with hot water and crystallization, there is obtained first *concentrated* B., and by further treatment this yields the *refined* B. In other places in Cal. the B. is found mixed with sand in a light granular form, containing abt. $\frac{1}{3}$ th of the pure salt, while large crystalline masses of it occur below the surface of the ground. In all these cases a similar method of purification is adopted. The production of B. in the Pacific states was: (1872) 280,000 lbs.; (1876) 5,140,000 lbs.; (1884) 3,732,000 lbs.; (1887) 11,000,000 lbs.; restricted (1888) to 7,589,000 lbs. In Europe large quantities of *artificial* B. are prepared from the Boracic Acid (q.v.) of Tuscany. This, mixed with carbonate of soda, is heated in a furnace, carbonic acid being

liberated, and the crude salt is then dissolved in water to free it from impurities, and crystallized.

The common variety of B. contains 10 equivalents of water, $\text{Na}_2\text{B}_4\text{O}_7 + 10\text{H}_2\text{O}$, and forms prismatic crystals; but another variety exists, *octahedral* B., containing only 5 molecules of water. B. is soluble in 12 times its weight of cold water, and in half its weight of boiling water, yielding a clear solution with slightly sweetish taste. It is of great use in the chemical arts owing to its properties of dissolving metallic oxides, and of forming a flux when heated with other substances. On this account it is much used in connection with the Blowpipe (q.v.), before which it yields different colored glasses corresponding to the metals present. It is used as a mordant in calico-printing, and as an adjunct to, or substitute for, soap in washing, it gives satisfactory results in the proportion of $\frac{1}{2}$ lb. to 10 gallons of water. As an insecticide, it is very powerful, specially destructive to cockroaches. For preserving meat, fish, butter, and milk, either alone or along with Boracic Acid (q.v.), B. has wide application. Besides these technical uses, B. is much used in medicine as an antiseptic, being applied in powder or as a lotion to ulcerating surfaces, and in the treatment of the infantile disease thrush; also in lozenges for relieving the hoarseness of public speakers.



Crystal of Borax.

BORBECK: town of Prussia, about 20 m. n.e. of Dusseldorf, some 10 m. from the Rhine. It has important iron industries, and coal is mined in the neighborhood. Pop. (1871) 16,857; (1891) 28,714.

BORBORYGMUS, n. *bör'bör-ig'müs* [Gr. *bōrbōru'zo*, I produce a rumbling in the bowels]: the gurgling noise produced by the movement of wind in the intestines.

BORCER, n. *bör'sër* [from BORE 1]: an instrument for boring holes in large rocks in order to blow them up.

BORD, n. *börd*, a miner's term for the face of coal parallel to the natural fissures.

BORDA, *bor-dâ*, **JEAN CHARLES**: 1733, May 4—1799, Feb. 20; b. Dax, dept. of the Landes, France: practical mathematician and astronomer. In 1771, he was associated with Verdun and Pingré in proving the accuracy of chronometers. He also studied ship-building, and suggested great improvements in the form of vessels. In 1787, he was active in bringing the observatories of Paris and Greenwich into closer relations with one another. With Delambre and Méchan, he was prominent in the French commission intrusted with the measurement of a meridian arc. He rendered essential service in the commission on the new system of weights and measures, and invented a new instrument for measuring the inclination of the magnetic needle; and his corrections of the seconds pendulum are still in use. But his reputation depends mostly on his improvement of the reflecting circle, on which instrument he published a work in two vols. (Par. 1787). He died at Paris.

BORDEAUX, *bör-dō'*: important seaport town of France,

BORDEAUX.

chief town in the province of Gironde, beautifully situated in a plain on the left bank of the Garonne about 60 m. from its mouth in the Atlantic. Ships of more than 1,000 tons burden can easily ascend the river at high water to B., which is accessible at all times to vessels of 600 tons. Its harbor is very capacious; and, by the Garonne, its commerce very extensive. The river is crossed by a noble bridge of 17 arches, 532 yards in length, erected by the elder Deschamps, 1811-21. The old town, consisting partly of high wooden houses of the 15th c., has narrow crooked streets; but the newer parts of the city and the suburbs have wide streets, fine squares, and pleasant promenades lined with trees. The cathedral, consecrated 1096, is remarkable for its beautiful towers. The church of St. Croix is of the 10th c.; that of St. Seurin also is very old, and has rare Gothic ornaments. The former archiepiscopal palace is now the town hall. The Great Theatre is one of the largest and finest buildings of its kind in France. B. has many other fine public buildings, and learned associations, and educational and benevolent institutions, with a public library of upward of 140,000 vols. The univ., founded by Pope Eugenius IV., 1441, has been, since 1839, an *Académie Universitaire* with 15 professorships.

Among principal branches of industry are the production or preparation of sugar, brandy, liqueurs, vinegar, nitric acid, principal calicoes, woolen goods, carpets, hats, paper, earthenware, glass bottles, metallic wires, madder, and resinous articles. The rope-works, cooperages, and dock-yards are extensive and full of activity. The Canal du Midi, connecting B. with the Mediterranean, enables it to supply the whole south of France with the colonial produce which it imports; and also with English tin, lead, copper, coal, dye-stuffs, herrings, etc. Wine, brandy, vinegar, dried fruits, hams, turpentine, and glass bottles are among its principal exports.

Except the wines of Champagne, no French wines are so much exported to foreign countries as those grown in the district of B. and known as BORDEAUX WINES. Some of them are red (*Claret*), others white. Of the red wines the Medoc is one of the best known. The red wines produced by the vineyards of Lafitte, Latour, Château-Margaux, and Haut-Briou are particularly celebrated for their quality. The white wines of Graves, and those of Sauternes, Barsac, Preignac, and Langon are in highest repute.

In former times, B. was called *Burdigala*, and was the capital of the *Bituriges Vivisci*. It was a very prosperous town in the times of the Romans, was made by Hadrian the cap. of Aquitania Secunda, and was both the principal emporium of the s.w. of Gaul, and the seat of its best educational institutions. It was taken by Charles Martel, 735; but was again spoiled by Norman plunderers in the 9th c. It became the cap. of the duchy of Guienne; and in 1152 passed, by the marriage of Eleanor of Guienne with Henry of Normandy (afterward Henry II. of England) under the dominion of England. B. was for a considerable time the seat of the splendid court of Edward, the Black Prince.

BORDEAUX MIXTURE—BORDENTOWN.

During the Revolution, B. was the principal seat of the Girondists, and suffered fearfully at the hands of the Terrorists. Its inhabitants, disaffected to Napoleon's government, were the first to declare for the Bourbons in 1814. During the Franco-Prussian war a delegation of the Government of National Defense, retreating before the advancing German army, stationed itself, 1870, Dec., at B.; and the first sittings of the national assembly, 1871, were held there. Since the restoration of peace, the export-trade of B. has increased greatly. In wines, there was an increase, 1859-71, of 124 per cent. in the quantity, and 73 per cent. in the value. Of late, the exports of wine have decreased. The total exports from B., 1881, had a value of \$63,700,000. About one-sixth of the export of wine goes to the British Dominions. Pop. (1901) 257,638.

BORDEAUX MIXTURE: see FUNGICIDES.

BORDEL, n. *bör'äĕl*, or BORDELLO, *bör-dĕl'lä* [It. *bordello*, a little house—from L. *bordus*, a house]: a brothel; a house of ill fame.

BORDELAIS, *bord-lä'*, or *bor-dĕ-lä'*: district of France, formerly part of the old province of Guienne, having Bordeaux for its capital; now included in the depts. of Gironde and Landes.

BORDEN, *bor'dĕn*, GAIL: 1801, Nov. 6—1874, Jan. 11; b. Norwich, N. Y. He became a teacher in Miss. 1822, was also a govt. surveyor; removed to Tex., became prominent in political affairs, arranged for the surveys and the first map of the colony, founded a newspaper, surveyed the city of Galveston, and was the first collector of that port. He invented various concentrated foods, of which condensed milk gave him a world-wide reputation. He also devised methods for concentrating tea, coffee, and the juices of fruits, became very wealthy, and was noted for his liberality. He died at Borden, Texas.

BORDEN, *bor'dĕn*, SIMEON: 1798-1856; b. Fall River, Mass.: civil engineer and inventor, self-educated. In 1830, he invented an instrument for measuring base-lines in trigonometrical surveys, which proved superior to any then in existence. It was inserted in a tube 50 ft. in length, and accompanied by four compound microscopes. From 1834-40, he superintended the state survey of Massachusetts, the first geodetic survey in America.

BORDENTOWN, *bor'den-town*: a city of Burlington co., N. J., on the Delaware river, 6 m. s.e. of Trenton. It is on the Camden and Amboy railroad, 28 m. from Philadelphia. It has a bank, the Bordentown Female College, a printing-office, 8 churches, and several iron-works and machine-shops. Steamboats run regularly between this place and Philadelphia. Near Bordentown is the former residence of Joseph Bonaparte, brother of Napoleon I. Pop. (1900) 4,110,

BORDER.

BORDER, *n.* *bawr'der* [F. *bord*, and *bordure*, **border**, edge: AS. and Icel. *bord*; Sp. *bordar*, to edge, to embroider]; the outer edge or part of anything; the surrounding line or limits of a large or small tract of land: V. to be near to; to reach to; to adjoin; to adorn with a border; to ornament; to limit. **BOR'DERING**, *imp.* **BOR'DERED**, *pp.* *-dèrd*. **BOR'DERER**, *n.* *-dèr-èr*, one who dwells at or near the boundary of a country.—**SYN.** of 'border, *n.*': boundary; bounds; frontier; confines; precinct; limit; purlieu; edge; verge; brink; brim; rim; margin.

BOR'DER, **THE**: in historical and popular phraseology, the common frontier of England and Scotland: applicable also to the common frontier of any adjacent countries. At present, the dividing boundary of England and Scotland consists partly of natural and partly of imaginary outlines. It is customary to speak of Scotland as a country 'north of the Tweed;' but the Tweed is the boundary only in a small part of its course, on the east; and large portions of several Scottish counties lie s. of that river. Even at its mouth, the Tweed is not the division; for n. of the river at its estuary lies the ancient town of Berwick with the district known as its 'bounds,' which belongs to England. The Tweed forms the division only for about 16 to 18 m. Leaving the river at Carham Burn, a few m. above Coldstream, the line proceeds toward the Cheviot mountains, the ridge of which is the boundary for about 25 m.; descending thence, the line strikes on Kershope Water, tributary of the Esk. That river is the boundary for a number of miles to a point above Longtown. The line now quits the Esk abruptly in a n. direction, and taking into England part of what was known as the 'Debatable Land' (q.v.), strikes on the small river Sark, which is the boundary as far as to the Solway Firth, the great natural division on the west. The entire boundary from sea to sea is about 100 m. in length. The counties lying on the English side of the border are Northumberland and Cumberland; on the Scottish side, Berwickshire, Roxburghshire, and Dumfriesshire. The division here indicated is comparatively modern; in former times, the frontier shifted according to the surging tide of war or diplomacy. For several ages prior to the 11th c., the kingdom of Northumbria, forming a part of what is now England, included all that portion of Scotland s. of the Firth of Forth as far w. as Stirling. As a result of some warlike operations, this district was ceded by the Earl of Northumberland to Malcolm II., King of Scots, 1018, and ever since the Tweed, in its lower part, has been the boundary. What, however, was gained by Scotland on the e. was lost on the w.; for William the Conqueror wrenched Cumberland from the northern sovereign; and with little intermission since that time the boundary in this quarter has been as at present.

From the 11th till the end of the 17th c., there was almost constant disturbance on the border. Ruthless wars on a great scale between English and Scots sometimes caused most frightful devastation, and became the source

BORDER.

of lasting ill-will on both sides. History abounds in events of this kind, and the feuds and forays of clans and families are commemorated in a series of ballads, forever embalmed in the *Minstrelsy of the Scottish Border*, by Sir Walter Scott. The most notable of these forays from the Scottish side is narrated in the ballad of the *Battle of Otterburne*, sometimes called *Chery Chase*, which occurred 1388. Among the latest of the regular invasions from England was that in 1543, in the reign of Henry VIII., conducted by the Earl of Hertford. The invasion was by the eastern marches, and in their devastating course, the English army set fire to and destroyed all the towns, villages, monasteries, and numerous castles within a wide range of country. At an early date, wardens and commissioners had been appointed to repress petty insurrections, and punish the moss-troopers who made cattle-lifting from their neighbors on the opposite side of the border a kind of business. For these measures of police, the border was divided into three parts—the eastern, middle, and western marches. Such was the lawlessness in the early part of the 16th c., that in 1511, Sir Robert Kerr, warden of the eastern marches, was slain at a border meeting by three Englishmen. The principal murderer escaped as far as York, and for a time tried to conceal himself; but he was sought out by two of Sir Robert's followers, who brought his head to their new master, by whom, in memorial of their vengeance, it was exposed at the cross of Edinburgh (Scott's *Essay on Border Antiquities*). Sometimes the Scottish borderers met ostensibly to amuse themselves with the ancient sport of football, but in reality to plan and execute daring military exploits. During the reigns of Elizabeth and James VI., strenuous efforts were made to preserve peace on the border, but this was attained only by extraordinary severities. Many of the more audacious reivers were hanged, and great numbers were banished. Some account of the measures adopted at this period to suppress border outrages will be found in the *Memoirs of Sir Robert Cary*, who long acted as English warden on the marches; also in the *Domestic Annals of Scotland*, by R. Chambers, vol. i. After the accession of James to the English throne, a sweeping clearance of the Scottish border was effected. The laird of Buccleuch collected under his banners the most desperate of the border marauders, whom he formed into a legion for the service of the states of Holland. At the same time, the Debatable Land was cleared of the Græmes, a daring sept of freebooters, who were transported to Ireland, and their return prohibited under pain of death. The legislative union of 1707, and the firm administration of justice, along with a general improvement in manners, terminated the long disorder.

In the present day, there is nothing to distinguish the border from other districts, unless it be the picturesque ruins of old castles, generally roofless, but, from the vast thickness and strength of the walls, still in good preservation. The border strongholds were of three kinds—regular fortresses, large baronial castles, and the smaller kind of towers. On the e. the English owned the fortified town of

BORDER.

Berwick, and at no great distance Newcastle-on-Tyne; and on the west, Carlisle. The chief Scottish border fortresses were the royal castles of Roxburgh, Jedburgh, and Lochmaben; and Edinburgh Castle might almost be included, for it is only 60 m. distant. Among the baronial castles on the English side were numbered Norham, Alnwick, Bamborough, Naworth, Brougham, Penrith, and Cockermouth. Among the Scottish fortlets of the baronial class may be mentioned Newark, Hermitage, and Caerlaverock. The smaller kind of towers on both sides of the frontier appear to have been exceedingly numerous, and it is their remains that form the more conspicuous memorials of old border strife. These buildings consist of a single square tower, usually of three floors; the lower vaulted, for the reception of cattle; while the two upper, consisting of but one small apartment each, with narrow slit-hole windows, comprised the accommodation for the family. It is conjectured, however, that retainers lived in thatched huts outside, now obliterated, and were brought into the tower, with the cattle, only in the case of an anticipated attack. These towers, known as *bastel-houses* or *peels*, once residences of a warlike yeomanry, are thickly studded over the s. of Scotland, more particularly along the vale of the Tweed; and by the lighting of beacons on their summits, the whole country between the border and the Forth could be speedily summoned to arms. On the English side, there are similar towers, such as those of Thirlwall, Fenwick, and Widdrington. The English border castles of every kind appear to have been of greater splendor and strength than those on the Scottish side. 'Raby Castle, still inhabited, attests the magnificence of the great Nevilles, Earls of Westmoreland; and the lowering strength of Naworth shows the power of the Dacres' (*Scott*). On the English side, however, there is nothing which can be compared to the ruins of that remarkable group of Scottish border abbeys—Melrose, Dryburgh, Kelso, and Jedburgh, with the remains of various other religious houses. For an account of these and other architectural remains on the border, see the *Border Antiquities of England and Scotland*, by Sir Walter Scott, 2 vols. folio, illustrated with plates; also Billings's *Baronial and Ecclesiastical Antiquities of Scotland*, 4 vols. 4to, illustrated with plates.

Assimilated in habits to the rest of the population, the old Scottish border families are still distinguishable by their surnames—as, for example, the Maxwells, Johnstons, and Jardines on the west, and the Elliots, Armstrongs, Scotts, and Kerrs on the middle and eastern marches. The principal Scottish border families of rank are the Scotts, Dukes of Buccleuch, descendants of a famed border chief, Sir Walter Scott of Buccleuch; and the Kerrs, Dukes of Roxburgh, sprung from an equally celebrated borderer, Sir Robert Kerr of Cessford. The possessions of both families are extensive, particularly those of Buccleuch (q.v.), which spread through several counties. The family of corresponding rank within the English border is that of the Percies, Dukes of Northumberland. Local intercourse across the

BORDER-WARRANT—BORE.

border is considerably obstructed by the long range of hills and the moors which generally lie on the line of boundary; and the circumstance of the peculiar civil and ecclesiastical institutions of the two kingdoms shedding off here toward different centres, still further tends to lessen community of feeling. Not very long ago, certain excisable articles were charged with a less duty in Scotland than England, and the consequence was an active contraband trade on the border, chiefly by the mountain-passes and the Solway. Now, these duties are assimilated, and this demoralizing traffic has disappeared. The great channels of communication across the border are two railway routes, one by way of Berwick, and the other by Carlisle. There are also good roads in various directions for those who wish to explore this interesting district of country. Besides the books relative to the border above referred to, there are some works of local note, among which the most comprehensive is Richardson's *Borderer's Table-book*, 8 vols.; we may also refer to Jeffrey's *History and Antiquities of Roxburghshire*; Ridpath's *Border History*; and Veitch's *History and Poetry of the Scottish Border* (1877).

BORDER-WARRANT, in the Law of Scotland: warrant issued by the judge ordinary on the borders between Scotland and England, on petition of a creditor who desires to arrest the person or effects of a debtor residing on the English side. These warrants are not frequent. For the similar warrant in English and American practice, for arrest of an absconding debtor including any foreigner who may be in England on business or pleasure, see **ARRESTMENT FOR FOUNDING JURISDICTION: DEBTORS, ABSCONDING: FOREIGN ATTACHMENT: JURISDICTION**.

BORDIGHERA: small town of the Riviera, n. Italy, frequented as a health-resort. It is on a hill overlooking the Mediterranean, between Mentone and San Remo.

BORDONE, *bor-do'nā*, PARIS: about 1500 (or 1510)–1570 (or 1588); b. Treviso: Italian painter of the Venetian school. His first master was Titian; but he soon left him to study the works of Giorgione, whose style he adopted. Among his master-pieces are *Fisherman presenting the Ring of Saint Mark to the Doge*; *Venus and Adonis*; a *Madonna surrounded by several saints*; *The Martyrdom of Saint Andrew*; a *Paradise*. As a portrait painter, B. was almost the equal of Titian.

BORDURE, *bawrd'yôr*, or **BORDER**, in Heraldry: a frequent surrounding of coats of arms, the object of which is generally to show that the bearer is a cadet of the house whose arms he carries. The character of the B. often has reference to the profession of the bearer: thus, a B. *embattled*, is granted to a soldier; a B. *ermine*, to a lawyer.

BORE, v. *bôr* [Ger. *bohren*; Icel. *bora*; L. *forārē*, to bore: Fin. *purra*, to bite: Gael. *bodhair*, to stun with noise]: to bite or gnaw through; to make a hole in a hard body with some tool; to perforate; to pierce; to annoy by repeated applications; to harass by importunity or iteration:

BORE.

N. the hole made by piercing or boring with a tool; the cavity or hollow in anything, as in a gun-barrel; a person or thing that annoys. BO'RING, imp.: N. the operation of piercing holes; a perforation. BORED, pp. *bōrd*. BO'RER, n. one who, or that which. BOREDOM, n. *bōr'dūm*, realm or domain of bores; the state or condition of bores. BORING-BAR, a bar supported axially in the bore of a piece of ordnance or cylinder, and carrying the cutting tool, which has a traversing motion, and turns off the inside as the gun or cylinder rotates; a cutter stock used in other machines. *Note*.—BORE, in the metaphorical sense of 'to weary and annoy with talk and attentions,' is also referred to *bur*, as its original spelling, which, in that case, would literally mean 'a person who, by persistent importunity, sticks to one as close as a *bur* does to the clothes.'

BORE, v. *bōr*: pt. of BEAR, which see.

BORE, n. *bōr* [a word imitative of the sound produced: Icel. *bara*; Norw. *baara*, a wave or swell: variously expressed in English by *aigre*, *eagre*, or *hygre*]: the advancing front of the tidal wave as it ascends certain rivers or estuaries, especially at a spring-tide. *Note*.—In the river Hooghly it is called the *ban*, or swell of the tide; in the river Seine it is called *barre*: the name may be identical with Eng. *bar*, an impediment across a river, which the advancing tidal-wave always creates; in the river Ouse it is named the 'ægre, or egre.'

When a river expands gradually toward a very wide mouth, and is subject to high tides, the spring flood-tide drives an immense volume of water from the sea into the river; the water accumulates in the estuary more rapidly than it can flow up into the river; and thus there is gradually formed a kind of watery ridge stretching across the estuary, and rushing up toward the river with great violence. In some cases this ridge, or B. is many feet in height, and contends against the descending stream with frightful noise. This phenomenon is observable in several British rivers, as the Severn, Trent, Wye and Solway. The most celebrated bores are those of the Ganges, Brahmaputra, and Indus: in the Hooghly branch of the Ganges, the B. travels 70 m. in 4 hours, and sometimes appears suddenly as a liquid wall 5 ft. high. The Bay of Fundy has the largest B.—the tide being said to have at certain seasons a rise and fall of 60 or 70 ft.

BORE: the internal cavity of a cannon, mortar, howitzer, rifle, or other kind of firearm. In most cases it is cylindrical, and either *smooth* or *rifled*. In the United States the B. is cylindrical; but the English Lancaster and Whitworth guns have oval and hexagonal bores respectively. Technically, the B. of a gun often means simply the diameter of the internal cavity, and in that case is equivalent to calibre. For the process of boring of a cannon, see CAN-NON FOUNDING. The B. of a gun may be enlarged by an operation called 'boring up.' In the United States this is done usually for the purpose of 'converting' smooth-bore cast-iron guns into rifled guns of smaller calibre, by inserting a lining-tube of coiled wrought iron, having the spiral

BOREAL—BORELLI.

grooves called rifles. The 10-inch and 15-inch smooth bore guns are thus converted into 8-inch and 12-inch rifles respectively. Many English guns which were larger and heavier than necessary for the size of shot used, have been enlarged at Woolwich Arsenal by 'boring-up.' In 1839 a change was begun in the British naval armament by substituting heavier broadsides. Preparatory to this change, more than 2,000 iron naval guns were thus treated, and many have since been enlarged. Many 24-pounders were 'bored-up' to 32s; some even of the 18-pounders were thick and strong enough to undergo this process. About 1860, important experiments were made at Woolwich to determine whether the old smooth-bore iron guns, about 15,000 in number, could not only be 'bored-up,' but also rifled at the same time. These attempts were not satisfactory. Rifled guns have far greater accuracy and longer range than smooth-bores of equal calibre (see RIFLED ARMS).

BOREAL, a. *bō'rē-āl* [L. *borēus*, the north wind: Russ. *borei*]: northern; pertaining to the north, or to the north wind. **BOREAS**, n. *bō'rē-ās*, the north wind.

BO'REAS: Greek name of the northeast wind, blowing toward Hellas from the Thracian mountains, and personified in mythology as the son of Astræus and of Eos or Aurora, and the brother of Notus, Zephyrus, and Hesperus. B. was said to dwell in a cave of the Thracian Hæmus, to which he carried Oreithyia, the daughter of the Athenian king Erechtheus, who bore him Zetes and Calais—employed as the symbols of swiftness—and Cleopatra, the wife of Phineus. According to Homeric fable, he begat, with the mares of Erichthonius, twelve horses of extraordinary fleetness. The rape of Oreithyia was represented on the ark of Cypselos, where B. instead of feet has the tails of serpents. He had a temple in Athens, because he destroyed the ships of the Persians under Xerxes; and at Megalopolis, a yearly festival was celebrated in his honor, because upon one occasion he helped the Megalopolitans against the Spartans.

BORECOLE, n. *bōr'kōl*, or **CURLED COLEWORT** [see **COLEWORT**]: a hardy species of kale, whose leaves are loose and curled or wrinkled; Scotch kail; the *Brás'sica oléracéa*, ord. *Cruciféræ*. See **KALE**.

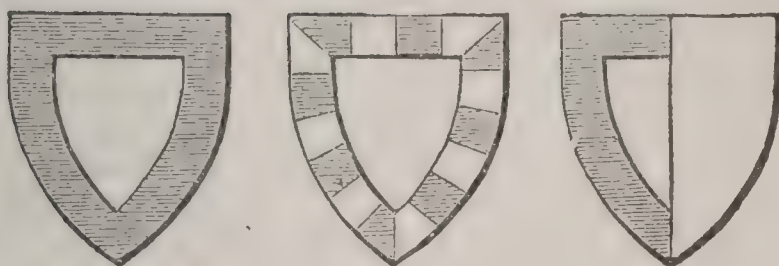
BOREE, n. *bō'rē*: an Irish dance said to have been brought from Biscay.

BOREL, n. *bōr'el* [O.F. *borel* or *burel*, coarse cloth made of the undyed wool of brown sheep, in former times the dress of the lower orders]: in *O.E.*, the coarse cloth or undyed wool forming the dress of the lower orders; a light stuff with a silken warp and woolen woof; the unlearned and common people, in contradistinction to priests or clerks; rude fellows: **ADJ.** dressed in borel; rude; unlettered.

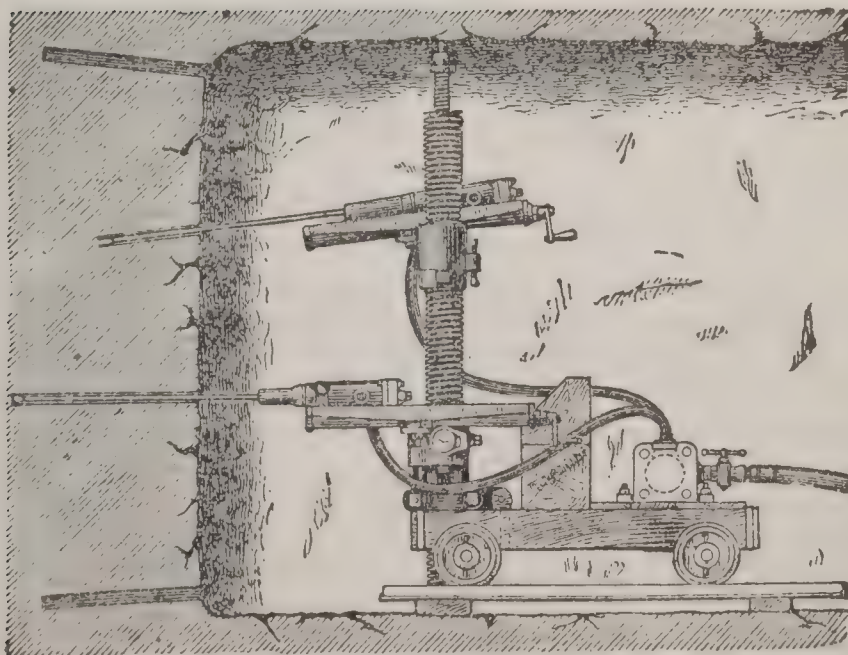
BORELLI, *bo-rēl'ē*, GIOVANNI ALFONSO: 1608-79; b. Naples; mathematician and astronomer, founder of the iatro-mathematical school. He was educated at Florence, and became prof. of mathematics at Pisa and afterward at Messina. Having taken part in a revolt, he was obliged to



Torture with the Boot.



Bordure.



Darlington Rock-boring Machine.

leave Messina, and spent the remainder of his life at Rome, where he had the patronage of Queen Christina of Sweden, and where he died. He carefully observed the motions of the satellites of Jupiter, then little known, and seems to have been the first to discover the parabolic paths of comets. He made valuable observations on a malignant fever in Sicily, and wrote a treatise on causes of such fevers. He wrote also an account of an eruption of Etna, and a number of works on subjects of applied mathematics, of which the most celebrated is that *De Motu Animalium* (Rome, 1680-1). In this work, he applies the laws of mechanics to the motions of animals, regarding the bones as levers, in which the power acts between the weight and the fulcrum, and endeavoring to calculate the power of muscles from a consideration of their fibrous structure, and the manner in which they are united to the tendons. All more recent authors on this subject have been much indebted to Borelli.

BORER: name common to wood-borers, in part larvæ of moths (e.g., 'the peach-tree B.,' an *Ægerian*, and one of the locust-tree borers, *Xyleutes robinia*); but mostly beetle-larvæ of various families, especially the Buprestians and the Capricorns (*Cerambycidae*). Almost every kind of tree is injured by the B. For trees attacked, see *U. S. Agri. Rep.* 1868. In the family *Ptidae* are small larvæ that bore the woodwork of furniture and houses; some penetrate library books also. The species of different countries are liable to be transported in furniture and lumber. The holes are filled up, as the insect works his way onward, with a fine powder, formed from the wood which it has eaten; and the pupa is formed near the wood-surface. The European *Anobium striatum* is dark brown, and not popular sense of that term. One of the most common British species is *Anobium striatum*, a dark-brown insect, not



Borer (*Anobium striatum*),
Natural size, and Magnified.

much above one line in length. The thorax, as in the whole tribe, is proportionately very large, and has a swollen hood-like appearance, the head being, as it were, received within it. This insect has long been noted for the pertinacity with which it simulates death. This instinct appears to be common to the whole tribe, as it is also to many other insects. Another species of the same genus, *Anobium tessellatum*, has become an object of interest as one of the insects which, being sometimes heard to make a peculiar ticking noise, are connected with superstitious fancies and fears, and receive the name of Death-watch (q.v.).

BORGHETTO, *bõr-gět'tõ*: town of Sicily, province of Pa-

BORGHESE—BORGHESI.

lermo, 13 m. w.s.w. from Palermo. It is a long straggling town, of mean houses, but picturesquely situated on a wooded cliff overhanging a plain, and itself overhung by a lofty precipice of red rock. Pop. 7,000.

BORGHESE; *bor-gā'zā*: family of great distinction in the republic of Siena, and afterward at Rome.

CAMILLO B. ascended the papal throne 1605 as Paul V., and by him other members of the family were advanced to high positions. A marriage with the heiress of the family of Aldobrandini brought the B. family into the possession of great wealth.

CAMILLO FILIPPO LUDOVICO B., Prince B.: 1775–1832; b. Rome: joined the French army when it invaded Italy; and in 1803 married Pauline, sister of Napoleon Bonaparte, and widow of General Leclerc. His wife subsequently received the principality of Guastalla, and he was created Duke of Guastalla, and under the French empire he was for some time gov.gen. of the provinces beyond the Alps. He held his court at Turin, and was very popular among the Piedmontese. He sold the B. collection of artistic treasures to Napoleon for 13,000,000 francs, receiving in part payment the Piedmontese national domains; but when these were reclaimed by the king of Sardinia, 1815, he received back some of the works of ancient art. After the overthrow of Napoleon, he separated from his wife, and broke off all connection with the Bonaparte family. He lost Guastalla, but retained the principalities of Sulmona and Rossano, his hereditary possessions.

The *Borghese Palace* is one of the most magnificent at Rome. The noble portico of the inner court is composed of 96 granite columns; the collection of paintings is remarkably fine.

BORGHESI, *bor-gā'zē*, BARTOLOMMEO, Count: 1781, July 11—1860; b. Savignano, central Italy: antiquary. His father, Pietro Borghesi, one of the most accomplished scholars of his time, trained him to an early delight in learned pursuits. He studied at Bologna, and afterward applied himself to archeological researches. He arranged the numismatic collection in Milan, and that of the Vatican, of which he drew up a catalogue. In 1821 he fixed his residence in the republic of San Marino, where he died. The French government undertook the publication of his works, of which 7 vols. appeared 1862–71. His principal work is his *Nuovi Frammenti Dei Fasti Consolari Capitolini Illustrati* (2 vols. Milan, 1818–20). His contributions to Forcellini's Latin Lexicon are very highly prized.

BORGIA.

BORGIA, *bor'já*: family originally Spanish, but which acquired great eminence in Italy after the elevation of Alfonso Borgia to the popedom, as Calixtus III., 1455 (d. 1458). He had previously been a privy-councilor of the king of Aragon.

RODRIGO B. ascended the papal throne 1492, Aug., under the name of Alexander VI. (q.v.). Before his elevation to the popedom, he had a number of children by a Roman woman named Vanozza (Giovanna de' Catanei), of whom two were Cesare and Lucrezia.

CESARE or CÆSAR B., son of Rodrigo B., was one of the greatest monsters of a time of depravity, when the court of Rome was the scene of all the worst forms of crime. He unscrupulously made use of the most sacred things as means to the most iniquitous ends. He had early received high ecclesiastical preferment, and his father, soon after becoming pope, invested him with the purple. But his father conferring upon his brother Giovanni the Duchy of Benevento, with the counties of Terracina and Pontecorvo, Cæsar, as was believed, moved with envy, caused his brother to be assassinated. He obtained the duchy and counties for himself, and was permitted by his father to resign the purple and to devote himself to the profession of arms. He was sent, 1498, to France, to convey to Louis XII. a bill of divorce and dispensation from his marriage with Anne of Brittany. Louis rewarded him for the pope's complaisance with the Duchy of Valentinois, a body-guard of 100 men, 20,000 livres of yearly revenue, and a promise of support in his schemes of ambition. In 1499, Cæsar married a daughter of the king of Navarre; and accompanied Louis XII. to Italy, where he undertook the conquest of the Romagna for the Holy See. The rightful lords of that country, who fell into his hands, were murdered, notwithstanding that their lives had been guaranteed by his oath. In 1501 he was named by his father Duke of Romagna. In the same year, he wrested the principality of Piombino from Jacopo d'Appiano, but failed in an attempt to acquire Bologna and Florence. He took Camerino, and caused Giulio di Varano, the lord of that town, to be strangled with his two sons. By treachery as much as by violence he made himself master of the Duchy of Urbino. A league of Italian princes was formed to resist him, but he kept them in awe by a body of Swiss troops, till he succeeded in winning some of them over by advantageous offers, employed them against the others, and then treacherously murdered them on the day of the victory, 1502, Dec. 31, at Sinigaglia. He now seized their possessions, and saw no obstacle in the way of his being made king of Romagna, of the March, and of Umbria, when, 1503, Aug. 17, his father died, probably of poison which he had prepared for twelve cardinals. Cæsar, who was a party to the design (and who, like his father, had long been familiar with that mode of dispatching those who stood in the way of his ambition, or whose wealth he desired to obtain), had himself partaken of the poison, and the consequence was a severe illness, at a time when the

utmost activity and presence of mind were requisite for his affairs. Enemies rose against him on all hands, and one of the most inveterate of them ascended the papal throne as Julius II. Cæsar was arrested and conveyed to the Castle of Medina Del Campo, in Spain, where he lay imprisoned for two years. At length he contrived to make his escape to the king of Navarre, whom he accompanied in the war against Castile, and was killed, 1507, March 12, by a missile from the Castle of Bianco. With all his baseness and cruelty, B. was noticeably free from the vice of intemperance in drink. He loved and patronized learning, and possessed a remarkably ready and persuasive eloquence. Macchiavelli has delineated his character in his *Principe*.

LUCREZIA B. was a woman of great beauty. She was married first to Giovanni Sforza, Lord of Pesaro, but this marriage was dissolved by the pope. She next married, 1498, Alfonso, Duke of Bisceglie, natural son of Alfonso II. of Naples; but he was assassinated by her brother Cæsar 1501. In 1501, Sep., she married Alphonso of Este, who afterward inherited the duchy of Ferrara. She died 1520. She has doubtless suffered in repute from association with her father and brother, and has been charged with the most detestable crimes, such as incest; but it is now conceded that for such charges there is no proof whatever. She was a patroness of art and learning. See Gregorovius, *Lucrezia B.* (1874).

BORGNE, *bõrñ* [F.]: a person having but one eye, or who sees with one only. In surgery and anatomy, the word is sometimes used figuratively for blind

BORGNE, *born*, LAKE: properly not a lake, but rather a bay or sound, in the s.e. of Louisiana, about 12 m. e. of New Orleans. It is connected with the Gulf of Mexico on the n.e., and communicates with Lake Pontchartrain at the n.w. by means of Rigolets Pass, which is about 10 m. long. The length of Lake Borgne is about 60 m; breadth 15 to 25 m.

BOR'GO: name of a number of towns and villages in Italy and southern Tyrol; indicating the growth of the town or village around a castle or castellated rock, the original Borgo. See BOROUGH. Thus, *B. di val Sugana* is a place of about 4,000 inhabitants, with a castellated hill, in Tyrol: *B. Lavezzaro* is an Italian town in the province of Novara, pop. about 3,000: *B. San Donino* (q.v.), etc.

BORGOGNONE, AMBROSIO (or IL BORGOGNONE): see FOSSANO, AMBROGIO STEFANIDA.

BORGOMANERO, *bor-go-mã-nã'ro*: town of n. Italy, province of Novara, 19 m. n.n.w. from Novara; near the left bank of the Agogna. It is a walled town, well built, and contains a communal college and a hospital. It has little trade. Pop. 5,300.

BORGO SAN DONINO, *bor'go sãn do-nẽ'no*: city of Italy, province of Parma, 14 m. n.w. from Parma, on the railway between Parma and Piacenza. It is surrounded by walls, has several good streets, is an episcopal see, and has a ca-

BORGOTARO—BORILLA.

thedral (the oldest part of which is in the Lombard style). several churches, and several educational institutions. Manufactures of silken, linen, and woollen fabrics are carried on; and oil and wine are produced in considerable quantities. The city derives its name from a saint, said to have been a soldier in the army of the Emperor Maximian, and to have suffered martyrdom here. The shrine of St. Donino has long been one of the most frequented in Italy. There are some curious remains of very rude mediæval sculpture in the cathedral. Pop. about 4,500.

BORGOTA'RO: town of n. Italy, province of Parma, 35 m. s.w. from Parma, on the left bank of the Taro, a tributary of the Po. It is encircled by walls, and is well built. The surrounding district is hilly and wooded. Pop. of commune, 7,000; of town, 2,200.

BORGU, *bor-gó'*, or **BARBA**: a district of Africa, in the Soudan, between 17°–20° n. lat. and 18°–21° e. long. It is partly mountainous, and partly a plain of drifting sand, with here and there limestone valleys, some of which are irrigated and occupied by nomadic tribes of Arabs.

BORIC ACID: see **BORACIC ACID**.

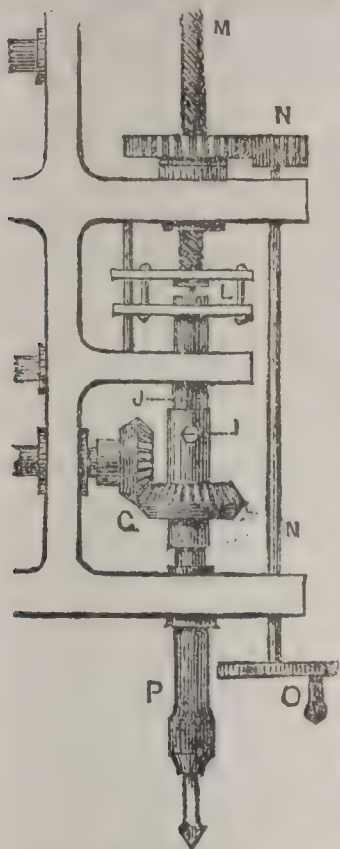
BORICKITE, *bōr'ík-īt* [from *Boricky*, who analyzed it]: a reddish-brown opaque mineral of waxy lustre, occurring reniform and massive. It contains phosphoric acid, 19·35–29·49; sesquioxide of iron, 52·29–52·99; water, 19·06–19·96; lime, 7·29–8·16; and magnesia, 0·–0·41. It occurs in Styria and Bohemia.

BORIDE, n. *bō'rīd*: a compound of boron (q.v.) with an element.

BORILLA, n. *bawr'íl-la* [etymology doubtful]: a rich copper ore in dust

BORING.

BORING: process in carpentry and in the working of metals; performed in a variety of ways. For boring holes in wood the carpenter makes use of *awls*, which simply displace a portion of the wood, and of *gimblets*, *augers*, and *bits* of various kinds, these last being applied by means of the crank-shaped instrument called a *brace*. The boring of holes in metal plates for making attachments, is effected by means of *drills* driven by machinery. The annexed figure shows the essential parts of such a boring machine. The drill is inserted in the end of a vertical spindle, P, which revolves in a fixed frame, and is driven by the bevel-wheels, G. The metal to be bored is placed on a table or other support below the drill; and the up and down motion, or end-pressure and off-action, of the drill is effected by the hand-gear, O, N, turning the screw M; which being coupled to the top of the spindle at L, presses it down or raises it, according to the way it is turned. The spindle slides vertically



Boring Machine. in the collar forming the axis of the bevel-wheel, but is carried round with it by means of the pin I, which projects into a groove seen at J.

For the Boring of Cannon and of Cylinders for steam-engines, see **CANNON-FOUNDING: LATHE**.

BOR'ING: process of perforation of earth and rocks. It comprises two operations—boring of shot-holes for Blasting (q.v.); and sinking of bores, either for drainage or in prospecting for minerals; also in forming wells for water, petroleum, salt-brine, etc. Blast-holes are made 1–2 in. or more in diameter. When they are to be made in hard rock by the simplest method, a steel-pointed drill is struck by a hammer, and after each blow is turned partly around to make the bore cylindrical; water poured into the bore from time to time facilitates the process of cutting, and preserves the temper of the drilling-tool. When many blast-holes are to be made, machinery supersedes hand-work. Usually the machine-drill imitates the action of the hand-drill, the cutting being done by percussion, and the chisel partly rotated after each cut. The machine-drill was first employed in boring the Mt. Cenis tunnel. The Burleigh rock drill, an American invention, is reputed to be one of the most efficient of machine-drills. It was used in the Hoosac tunnel from 1869 to the completion of the work. The rock to be perforated was gneiss alternating with quartz. The highest rate of progress possible with hand-drilling was 13 yds. per minute the Burleigh drill made 48 yds. In diamond-pointed drills the perforation is effected by pressing the tool against the rock and rotating it steadily, instead of making it cut into the rock by percussion. Brandt's rotatory borer is operated

BORING ANIMALS—BORISSOGLIEBSK.

on the same principle as the diamond drill, but has a crown of hardened steel instead of cutting diamond. When the rock to be perforated is of uniform structure, e.g., slate, an apparatus like the carpenter's brace and bit is used with advantage.

In prospecting for minerals and in sinking Artesian Wells (q.v.), the operations are performed either with boring rods or with rope-borers, or with diamond drills. In boring rods, the tools for cutting the rock and removing the *detritus* are fixed to rods which are lengthened as the bore increases in depth, and which are worked by hand or by machinery overhead. Soft ground can be perforated by tools like augers; but percussion is necessary where the ground is harder. When the depth is small the rods are lifted by hand, then allowed to drop, and partly rotated at each lift. For deep holes, and especially those of large diameter, steam machinery is employed to work the rod. The method of boring with the rope appears to have been used first in China. In this method the cutting tool is fastened to a rope, by which it is alternately raised and made to descend. In the diamond drill the working part is the 'crown,' a short piece of tube of cast-steel, at one end of which a number of black diamonds are fastened into small cavities: the crown is screwed on to wrought-iron pipes, which constitute the boring-rod. Machinery at the surface causes the rod to rotate, and the result is the cutting of an annular groove at the bottom of the hole, leaving a core, which, breaking off from time to time, is caught by a little shoulder and brought to the surface with the rod. In places where it is not necessary to preserve this core for verification of the rocks passed through, the crown bears diamonds in the centre also: in either case the *detritus* is washed away by a stream of water which is forced down the tube and flows up the sides. With this system a bore-hole can be deepened continuously at a speed unattainable by other methods, which require stoppages for cleaning out the bore. The diamond drill used for prospecting in the Lake Superior region can be used above or below ground. Two inclined cylinders drive a horizontal crank shaft, which works bevel gear, causing the drill to revolve. At the same time a countershaft is likewise set in operation, and this effects the advance of the drill by gearing driving the feed-screw: as there are three kinds of gearing, the speed can be varied at pleasure. The feed-screw and its connections are carried by a swivel-head, and this can be turned to drill holes at an angle. The rods are lap-welded iron tubes $1\frac{1}{2}$ in. in diameter, fitted with a bayonet joint.

BORING ANIMALS: see **BORER**.

BORISSOFF, *bō-rīs-sōf'*: town in Russia, in the government of Minsk, on the river Berezina, 46 m. n.e. of the city of Minsk; noted as the scene of the dreadful disaster to the retreating army of Bonaparte in its passage over the Berezina 1812, Nov.—Pop. 6,500.

BORISSOGLIEBSK, *bo-rīs-o-glěbsk*: city of Russia, cap. of the district of the same name, on the Worona river, near its confluence with the Khoper, about 100 m. s.s.e. of Tambova. Being connected by railroads and by navigable

streams with business centres in all directions, it has become a prosperous emporium. Pop. 12,254.

BORLASE, *bor'las*, WILLIAM: 1696, Feb. 2—1772, Aug. 31; b. Pendeen, Cornwall: English antiquary. Ordained a priest in the English Church 1720, he was, 1732, presented to the vicarage of his native parish of St. Just. Applying himself to a study of the natural history and antiquities of Cornwall, he in 1753 published, at the Oxford press, a vol. entitled *Observations on the Antiquities, Historical and Monumental, of the County of Cornwall*. This was followed, 1758, by the *Natural History of Cornwall*, Oxford. B. paraphrased the book of Job, and wrote several pieces of a religious nature, was active in the supervision of his parish, and took an especial interest in the improvement of its highways. He was one of Pope's correspondents, and furnished to the poet most of the curious fossils of which the Twickenham grotto was composed.

BORN, pp. *bawrn*: see BEAR, to bring forth. BORN AGAIN, having received spiritual life.

BORN, *bawrn*, BERTRAND DE: 1145?—1210? b. Perigord: French warrior and troubadour, prominent in the political and the literary history of his time. He defeated his brother in a contest for the family heritage. Richard the Lion-hearted sided with the brother; because he himself had been offended by certain of B.'s satirical songs. Thereupon B. favored Henry II. of England in the bitter quarrel between the king and his sons. Dante, in his *Inferno*, represents B. as among the damned, with his head cut off, and carrying it in his hand like a lantern.

His son BERTRAND DE BORN, poet and warrior like the father, is often confounded with him. It is supposed that he was killed in the battle of Bouvines (1214).

BORN, IGNATIUS, Baron von: 1742–91; b. Karlsburg, Transylvania: mineralogist and metallurgist. B. was educated a Jesuit at Vienna, but soon left the order, and studied law at Prague. After travelling he returned to Prague, studied mineralogy, and 1770 was received into the dept. of mines and the mint. Against opposition, he introduced amalgamation in Hungary, in place of smelting and cupellation, for extracting silver from ores, and was rewarded by the emperor. He was appointed by Maria Theresa, 1766, to arrange the imperial museum at Vienna, where he soon became councilor of state. B. was active in Hungarian politics, and was one to receive the rights of denizen from the diet of the Hungarian states. His works on mineralogy were of much importance at the time.

BORNE, pp. *börn* [see BEAR, to carry]: carried; defrayed as to expense.

BÖRNE: see BOERNE.

BORNEENE, *bor'nên*, or FLUID BORNEO CAMPHOR, or OIL OF CAMPHOR: a thin liquid, lighter than water, with a fragrant odor (somewhat resembling turpentine); obtained by distilling native oil of Borneo camphor, or oil of valerian. The B. is employed in perfumery.

BORNEO.

BORNEO, *bawr' nē-ō* (called by the natives *Pulo Kalamantin* or *Klemantin*, the name of an indigenous fruit): next to Australia and Papua, the largest island in the world; in the Indian archipelago, in 7° n.— 4° $20'$ s. lat., and 106° $40'$ — 116° $46'$ e. long. It is bounded on the e. by the Sea of Celebes and the Macassar Strait, s. by the Sea of Java, w. and n. by the Gulf of Siam and the China Sea. Its length is about 800 m., with a breadth of 700; about 290,000 sq. m.; estimated pop. 1,846,000. The largest part, on the s., e., and w., 203,714 sq. m., estimated pop. about 1,000,000, is a possession of Holland. On the n.w. coast is the state of Sarawak, 50,000 sq. m., pop. 300,000, under British influence and ruled by an English rajah. Northeast of Sarawak is the native state of Brunei, or B. proper, since 1890 under Brit. protection, 8,000 sq. m., pop. 50,000. Beyond Brunei is Brit. North B., the property of an English trading co., and since 1888 under Brit. protection, 30,000 sq. m., pop. 150,000. Between Brit. North B. and the Dutch possessions on the e. is the native state of Sulu. Of the remainder of the island, which comprises the interior, little is known. The soil of the peopled and explored part is very fertile and adapted to cultivation of all tropical productions. There is abundance of valuable timber, and the island has a rich fauna. The principal minerals, so far found, comprise, gold, coal, iron, diamonds, quicksilver, and antimony. The various states have considerable trade; exports including sago, bees-wax, camphor, spices, drugs, dyes, gold, coal, antimony, hides, rattans, indigo, tortoise-shell, cinnabar, trepang, gutta-percha, arrow-root, etc. Many varieties of fruit, spices, and gums are either indigenous to the soil or are exceedingly thrifty in it. Malays, Dyaks, Kyans, Negritos, Bugis, and Chinese are represented in the pop. of the settled parts, and the Kanowits, Pakatans, and various tattooed races inhabit the interior. The principal Dutch settlements are at Sambas, Pontianak (q.v.), Banjermassin, and Koti.—The coasts of B. have numerous small bays and creeks, but no deep indentations, are mostly low and marshy, with occasionally dangerous islets and rocks. Two nearly parallel ranges of mountains extend s.w. n.e. through the island, one terminating on the n.e. coast at Mount Kini Balu, 13,698 ft. above sea-level. Between them are well-watered plains. The principal water courses, of which there are many fine ones, have outlets on the n. and w. coasts, and comparatively unknown upper courses. They are the Brunei, or Borneo, Redjang, Barain, Bintulu, Sirabas, Batang-Luper, and Sarawak, on the n.; the Kutei, Bulungan, and Kuran on the e.; the Barito, Kahaijan, Kapuas-Murung, Mendawei, and Sampit, in the s.e.; and the Pontiana, Sambas, Simpang, Succadana, and Pawan, on the w. The Brunei alone is navigable for vessels of considerable size. Among numerous lakes, that of Kini Balu is the most notable, being 100 m. in circumference, containing many pretty islands, and having on its bank a circle of Dyak villages. The climate in the low grounds is humid, hot, and unhealthful for Europeans; but in the higher parts, toward the

BORNEO.

n., the temperature is generally moderate, the thermometer at noon ranging 81°–91° F.—The forests produce iron-wood, teak, gutta-percha, ebony, sandal-wood, rattans, dye-woods, benzoin, wax, dragon's blood, sago, various resins, vegetable oils, and gums. The camphor is the best in Asia, of which 4,500 lbs. are exported annually. The Mohor tree, well adapted for making native boats, attains a height of 80 ft., and the Kaladang, suited for large masts, 200 ft. Nutmegs, cloves, cinnamon, pepper, betel, ginger, rice, millet, sweet potatoes, yams, cotton, sugar-cane, indigo, tobacco, coffee, melons, citrons, pineapples, bananas, cocoanuts, etc., are largely grown. The mountains and forests contain many monkeys, including the orang-outang; the elephant is found on the n. coast, and the rhinoceros on the n.w.; domesticated animals are buffalos, sheep, goats, dogs, and cats. The birds are remarkable for their plumage. The principal are eagles, vultures, Argus-pheasants, peacocks, flamingoes, pigeons, parrots, and the swallows (*Collocalia esculenta*) which construct the edible nests prized by the Chinese for making soup. The rivers, lakes, and lagoons swarm with crocodiles, and many kinds of snakes, frogs, lizards, and leeches. Fish is plentiful, and the coasts are rich in tortoises, pearl-mussels, oysters, and bêche-de-mer or trepang. Brilliant butterflies and moths are in great variety, and silk worms are found. The diamond mines are chiefly in Landak and Pontianak (q.v.); Sambas produces the greatest quantity of gold; Brunei, Kutei, and Banjermassin the largest amount of coal. The Dyaks, supposed to be the original inhabitants, and almost all heathen, live chiefly in the interior, and employ themselves with land culture, collecting gutta-percha, resin, gums, rattans, gold-dust, and wax. They are divided into numerous tribes. The Malays dwell on the coast, are traders and bold sailors. They are more civilized than the Dyaks, cultivate the grounds around their houses, lay out gardens, keep cattle, and live partly by fishing. The Chinese, chiefly from Canton, have penetrated far into the interior. They engage in trade and mining, are unwearied in their efforts to make money and then return to their native country. They have always endeavored to live as an independent republic, under chiefs chosen by themselves, and according to Chinese laws. In 1857 the Chinese living in Sarawak (q.v.) rebelled against Sir James Brooke (q.v.), and were nearly exterminated. Subsequently the Dutch were also compelled to put them down by force of arms, and have imposed a poll-tax.—The Portuguese discovered B. 1521 and settled at Banjermassin 1690; the Dutch, under a treaty, erected a fort and factory there 1643, and one at Pontianak 1778; and the British, after futile attempts to make a settlement in B. 1702 and 74, gained their first success there through the enterprise of Sir James Brooke 1838.

Dutch Possessions and Protectorate.—By far the largest part of the island is ruled, directly or indirectly, by the Dutch, who have divided it into the Residency of the western division of B., and that of the southern and eastern—the former having Pontianak (q.v.), as a seat of govt., the

BORNHOLM—BORNING.

latter Banjermassin. The smaller portion toward the n. and n.e. contains Sarawak and the territories of the sultan of B. proper. Chief towns are Sambas (pop. 10,000), Pontianak (9,000) Banjermassin (30,000), Borneo or Brunei (20,000), Sarawak (25,000), and Kuching (12,000.) Besides a number of small dependencies, the Netherlands resident at Pontianak governs the important kingdoms of Landak, Mampawa, and Sambas, with the mining district of Montrado, in the n.; Tayang, Simpang, and Matan or Succadana, to the s.; and Sangouw, Sekadouw, and Sintang, in the interior. An assist. resident administers in the s.e. division of Dutch B. The produce consists of diamonds, gold, coal, tin, iron, wax, edible nests, pepper, gutta-percha, etc. There are many gold mines in Montrado and other districts; rich iron ores in Matan; gold, platina, copper, etc., in Sambas; and in former times Landak was rich in diamonds, but the product is now small. In this district was found the famed diamond of the sultan of Matan, which weighed 367 carats. The annual produce of the mines in the residency of Pontianak is estimated at not less than 425,000 ounces of gold. Pop. about 400,000; of whom 250,000 are Dyaks, 90,000 Malays, 25,000 Chinese, and about 150 Europeans. The Dutch imports and exports have each a value somewhat less than \$1,000,000 a year. The other Netherlands possessions in Borneo are called the Residency of the s. and e. division, including the lands from Matan, in the s.w., along the s. and e. coasts to $0^{\circ} 50'$ n. lat. The resident's house is at Banjermassin, on the island of Tatas, 15 m. from the mouth of the Banjar, $3^{\circ} 34' 40''$ s. lat., and $114^{\circ} 30'$ e. long. Exports are pepper, diamonds, gold dust, coal, benzoin, wax, rattans, dragon's-blood, camphor, edible nests, iron, firearms, etc. Imports—piece-goods, powder, knives, opium, rice, salt, sugar, Chinese porcelain, silk stuffs, coral, pearls, etc. In one year the coal mines of Orange-Nassau produced 3,650 tons. On the e. coast there is coal, and the sultan of Kutei delivers it according to contract, for the use of the Dutch navy, at about \$5 per ton. The imports of the s. and e. residency have an annual value of about \$1,250,000, and the exports about \$600,000. At Nagara (pop. 10,000) in Banjermassin, are important factories of firearms and other weapons.—There has been constant war on the s. and e. coasts since 1859. In 1860 the direct govt. of Banjermassin was assumed by the resident, but the interior of the kingdom has always been disturbed, especially in 1873, through the war with Atcheen (q.v.) inciting the Mohammedan population against the Dutch.—See *Borneo's Westerafdeeling, Geographisch, Statisch, Historisch* (P. J. Veth, Amsterdam); the latest colonial reports by the Netherlands sec. of state for the colonies, etc.

BORNHOLM, *börn' hōlm*: island in the Baltic Sea belonging to Denmark, about 90 m. e. of Seeland; area, with three small islands near, about 230 sq. m. It is rocky, and the most notable product is porcelain clay. The capital is Rønne, or Rottun, on the w. coast (pop. 7,000.) Pop. of the island, above 35,000.

BORNING, or **BONING** [from Fr. *borner*, to bound]: pro-

BORNU—BORO BUDDOR.

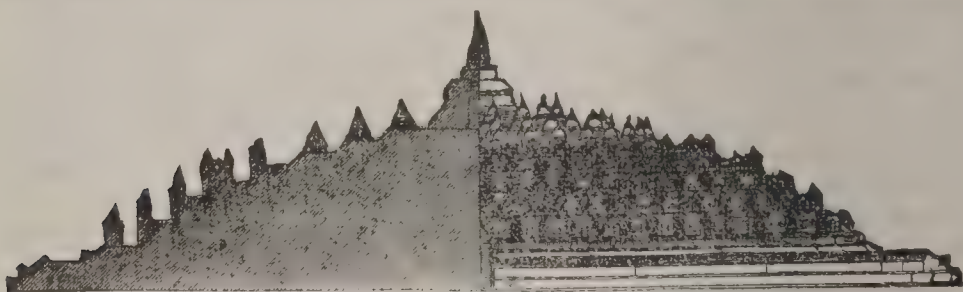
cess used by masons, surveyors, and gardeners in judging of the straightness or level of any surface or line by simply looking along two or more boning-pieces or boning-rods set up for the purpose.—The gardener's boning piece consists of a slip of board, about 18 in. long, fastened by its middle at right angles to one end of another slip 4 ft. long.

BORNU, *bõr'nô*: a state of Central Africa between lat. 10° and 15° n., and long. 12° and 18° e.; bounded on the e. by Lake Tchad, s. by Mandara, w. by Hausa, and n. by Kanem and the Sahara. The greater part of the country is perfectly level, and much of it is liable to be overflowed in the rainy season, which lasts from Oct. to Apr., when fevers and other diseases consequently prevail. The heat from March to June is excessive, ranging from 104° to 107° F. The two principal rivers are the Shari and the Yaobe, or Yo, both of which fall into Lake Tchad. The soil is fertile, and, although the cultivation is very imperfect, produces plentiful crops of maize, millet, barley, rice, various kinds of pulse, cotton and indigo. The inhabitants possess elephants, horses, buffaloes, oxen, sheep, etc. Wild beasts, as lions, panthers, etc., are very numerous, having their chief haunts in the forests which occur only in the vicinity of the rivers, and which abound also in birds of many kinds, snakes, crocodiles, etc. Wild bees are extremely plentiful. The country produces no iron, that which is used being brought from Mandara. Much care is bestowed upon the manufacture of coats-of-mail, both for horses and their riders. The only other manufacture carried to any considerable extent is that of cotton cloth, which is dyed with beautiful blue stripes by means of indigo, and much exported to Fezzan. The population, which is estimated at about 5,000,000, is mostly of the negro race, and called Kanowry. The ruling race, called Shuwas, are of Arab descent, and bigoted Mohammedans; but many traces of Fetishism remain among the masses. Whatever they have of civilization they derive from the Arabs. The slave trade is eagerly prosecuted, and gives occasion to many warlike expeditions. B. appears to have existed as a state for many centuries, but in the beginning of the present c. it was conquered by the Fellatahs, whose yoke, however, was soon shaken off under the leadership of a fanatic fakir named Mohammed el Amin, whose services were called in by the sultan. On Mohammed's death, his son Omar became ruler of B. instead of the sultan. Dr. Nachtigal, who visited B. in 1870, describes it as rapidly decaying.

BORO BUDDOR (the Great Buddha): the ruin of a splendid Buddhist temple in Java, residency Kadu, regency Magelang, and dist. Minoreh, near the junction of the Ello and Progo; the most elaborate monument of the Buddhist style of architecture anywhere existing. Buddhism (q.v.) was early introduced into Java, and Javanese chronicles place the building of B. B. in the beginning of the 7th c. The figure (copied from Fergusson's *Hand-book of Architecture*) represents a section through one half, and an elevation of the other half of the building. It is a pyramid of a

BORODINO.

square form, each side at the base measuring 600 ft., and consists of seven walls, built like the steps of a stair up a hill. Between the walls are narrow terraces running round the building. The walls are richly ornamented with statuary. Outside are niches, each occupied by a statue of Buddha, larger than life, seated in the usual attitude, with his legs crossed under the body. The number of these figures is about 400. Between each of these are bas-reliefs, representing the god in the same attitude, besides architectural ornaments and carvings of all sorts. Below the niches, on the lower story, is an immense bas-relief running round the whole building, representing scenes from the life of Buddha, and religious subjects. The inner faces of the building are also profusely ornamented with bas-reliefs, seated figures and architectural ornaments, to an extent unrivalled by any other building in the world. The art of sculpture appears in Java to have early attained a very high development. Above and within the upper square terrace are three circular ones, the outer ornamented with 32, the next



Elevation and Section of Temple of Boro Buddor.

with 24, and the upper with 16 small domes, each containing a seated statue of Buddha, which can be seen through the open work of their roofs. The whole is surmounted by what must be considered as the Pagoda (q.v.) itself, now empty, its centre occupied only by a sunken chamber 10 ft. deep, meant originally, no doubt, to contain the relic for which this splendid temple was erected.' Mr. Ferguson considers that the five lower terraces are copied from and represent a Buddhist vihara or monastery; and that the niches containing the cross-legged figures were, in the originals, cells, each occupied by a shaven priest. The structure is thus a compound of a Tope (q.v.) with a copy, in durable architecture, of the frail cells of a vihara.

BORODINO, *bör-ō-dē'nō*: village of Russia, govt. of Moskwa, about 70 m. w. from the city of Moscow. It is on the Kalouga, an affluent of the Moskwa, and gave name to the great battle fought between the French army under Napoleon, and the Russian under Kutusow, Barclay de Tolly and Bagration, 1812, Sep. 7. This battle was one of the most obstinately disputed in history, and the loss on both sides was almost equally great. Out of 240,000 men engaged, between 70,000 and 80,000 were killed and wounded. The Russians retreated on the following day, but in perfect order, and without the enemy venturing to attack them. The Russians, therefore, have always held this battle as a victory, and in 1839 raised a fine mausoleum

BORON—BORONIA.

on the battlefield. To the French, however, certainly belongs the honor, as they not only remained on the field of battle, but in seven days after had pushed on to Moscow. The French name it the battle of the Moskwa, from the river of that name, and it gave Marshal Ney his title of Prince of Moskwa.

BORON, n. *bō' rōn* [from the root *bor* in *borax*]: in *chem.*, a metalloid, one of the elementary substances, the base of boracic acid. **BORURET**, n. *bōr' ūr-ēt'*, a combination of boron with a simple body. **BORON ACID**, same as *boracic acid*.

BO'RON (symb. B, at. wt. 11): non-metallic element present in Boracic Acid (q.v.) and Borax (q.v.). It was discovered 1808 by Gay-Lussac and Thenard in France, and Davy in England. The process followed in procuring B., till lately, was to mix pure and dry boric oxide (B_2O_3) with thin slices of the metal potassium (K), and heat them in a tube, when three atoms of the potassium abstracted the oxygen, forming potash (K_2O), and set free the boron (B.). On cooling and washing the mixture with cold water, the potash dissolved out and left the B. as a dark greenish-brown powder, which, when heated, burned with a green flame, and was re-formed into boric oxide by combining with the oxygen of the air. This *amorphous boron* is now obtained by heating boric anhydride with sodium. A crystalline form (Wöhler and Deville having discovered the method) is obtained by heating to a high temperature with aluminium, when B. is left as minute crystals interspersed through the earth alumina. These crystals possess great interest from their similarity in properties to pure crystallized carbon, or the diamond, and they are now known among scientific chemists as *B. diamonds*. They are remarkably transparent, are tinged yellow or red (though the colors may be accidental), and rival the ordinary diamond in their lustre and refractive power. B. diamonds not only scratch glass, but scratch also the corundum and sapphire; and a real diamond, with which a few B. diamonds were crushed, had its edges worn away. It is apparent, therefore, that the B. crystals possess in a high degree the characters of the ordinary diamond; and though they have as yet been obtained only in minute specks, yet it is not too much to expect that the size will be increased, and the artificial B. diamond come into market as an article of ornament, to rival the *natural* carbon diamond in its mysterious power of flashing back the rays of light. Indeed, so like are these two kinds of diamonds, that they can scarcely be distinguished by outward characters or signs; and it has been gravely suggested that some of the diamonds which now adorn the brow, the neck, or the arm, may be natural B. diamonds. They are very indestructible, requiring a high temperature to destroy them: and like the true diamond, heat ultimately forms them into a *coke*. B. forms but one oxide, boric oxide (or anhydride), B_2O_3 .

BORONIA, n. *bō-rō' nī-a* [after *Borone*, an Italian]: a genus of plants, ord. *Rutācēæ*, many cultivated as elegant hot-house shrubs: *B. mēgāstīa' mǎ* [Gr. *mēgas*, great, and

BOROUGH.

stigma]: a favorite species with twiggy branches, and copious axillary flowers which have a delicious aromatic fragrance.

BOROUGH, n. *bŭr'ō* [AS. *burh* or *burg*, a city: Icel. *borg*; It. *borgo*; F. *bourg*, a town—from Goth, *bairgan*; AS. *beorgan*, to protect: mid. L. *burgus*, a small fortified place, a collection of houses: compare Gael. *buar-ach*, an inclosure for cattle—from *buar*, cattle]: formerly a collection of houses inclosed or fortified by a wall, or protected by a *burg* or castle; a corporate town; a town which sends a burgess to parliament. BOROUGHMONGER, n. [see MONGER]: one who traffics in the patronage of parliamentary boroughs.—*Borough* is a term of varying application; in general a corporate town or any organized municipality, but in some localities a cluster or close collection of houses. It seems to have meant first a hill, or heap of earth; and it was probably from the elevated positions on which places of defense were erected, that it came to signify a fortification or castle, and latterly the aggregate of houses, churches and other structures, which, in unsettled times, usually gathered under the walls of a castle; together with their inhabitants, and the arrangements for their government. The questions whether municipal corporations are due to Roman, or to Saxon and other Teutonic influences, or to both; and if to both, then to what extent to each, have been keenly discussed by constitutional historians. So far as etymology goes, its authority is almost equally divided, the term *municipal*, from the Latin *municipalis*, and *city*, from *civitas*, favoring the Roman side, while B. from the root above indicated, and *town*, from the Saxon *tun* or *dun*, a fortified hill, support the Teutonic. On the Roman side, Sir Francis Palgrave is the most uncompromising, while Mr. Allen seems the more judicious champion. The Teutonic side is favored by most of the Anglo-Saxon scholars of England, and in general by German writers. But from whatever source derived, that the boroughs of England existed, not as aggregates of houses merely, but as corporate bodies, in the Saxon time, is now generally admitted. The B. system of Scotland is also of great antiquity. 'A *Hanse*, or confederation of boroughs for mutual defense and the protection of trade, existed in Scotland, and was known by this name in the reign of David I., about a century before the formation of the Hanseatic League of the continental cities; and the famous burgh laws date from about the same period. This code of Scotch burghal regulation,' in Mr. Innes's opinion, 'though collected in the reign of David I. and sanctioned by him, was the result of the experience of the towns of England and Scotland;' and he goes on to show the very close resemblance between these laws and the burghal usages of Newcastle, and even of Winchester; which suggests their common Saxon origin. Mr. Innes speaks favorably of the B. life of our ancestors; and he considers the burgh domestic architecture, of which monuments remain sufficient to show that 'the burgess of the Reformation period lived in greater decency and comfort than the laird, though without the

BOROUGHBRIDGE—BOROUGH FUND.

numerous following, which no doubt gave dignity if it diminished food. I am not sure that this class has gone on progressively, either in outward signs of comfort, or in education and accomplishment, equal to their neighbors. The reason, I suppose, is obvious. The Scotch burgher, when successful, does not set himself to better his condition and his family within the sphere of his success, but leaves it, and seeks what he deems a higher.' In confirmation of this view, Mr. Innes elsewhere mentions that 'many of the old citizen-merchants of Edinburgh had studied at the university, and appear in the list of graduates.'

Borough, in England, is properly a city or other town that sends burgesses to parliament: see PARLIAMENT.

In the United States, the term B. is applied variously. In Penn. and Minn., B. is an incorporated municipality with less pop. than a city, and differently governed: it is one of the primary divisions of a co. In Conn. and N. J. it is a minor geographical division, usually not politically organized, and including only the region occupied by houses adjoining each other or in a cluster.—See MUNICIPALITY: TOWN: CITY: also BURG: BURGH.

BOROUGHBRIDGE, *bŭr'ō-brĭj*: town in West Riding, Yorkshire, on the right bank of the Ure, here navigable for small craft, 20 m. n.w. of York. It arose simultaneously with the decline of Aldborough, 1½ m. to the e., soon after the Conquest, when the great north road was diverted from Aldborough to this place. Its chief trade is in agricultural produce and hardware. Edward II., 1321, defeated the Earl of Lancaster here. Near B. are three immense Druid stones, called the 'Devil's Arrows,' 16 to 22 ft. high. Pop. of B. 966.

BOROUGH ENGLISH: custom in some ancient boroughs in England, according to which the youngest son inherits the property within borough in preference to his elder brothers. See CUSTOM: GAVELKIND: INHERITANCE.

BOROUGH FUND: certain rents, profits, dividends, interest, etc., payable to certain bodies corporate connected with a borough, required in English law to be paid to the treasurer of the borough. See FUND: CORPORATION: MUNICIPALITY.

BOROUGH JUSTICES—BORROMEAN ISLANDS.

BOROUGH JUSTICES: first created in the time of Charles I.: see JUSTICES.

BOROUGH LAWS: in Scottish legal history, ancient laws relative to boroughs or *burghs*, which have long ceased to have force, but throw light on the ancient manners and customs of the country. The authenticity of these B. L. is beyond question; they are universally allowed to have been enacted in the reign of King David in the 12th c. See REGIAM MAJESTATEM.

BOROUGH RATE: in England, a rate levied within borough by order of the council of the same. It supplements any deficiency of the Borough fund (q.v.).

BOROVITCHI, *bŏr-ō-vīt'chē*: town of Russia, govt. of Novgorod, 98 m. e. of the town of Novgorod, on both sides of the river Msta, near some rapids. Its situation on the great canal and river water-way which connects the Volga with Lake Ladoga, gives it considerable commercial importance. Pop. (1882) 10,375; (1890) 10,994.

BOROVSK, or **BOROVSK**, *bŏ-rŏvsk'*: town of Russia, govt. of Kalouga, 49 m. n.n.e. of the town of Kalouga, jointly with which it gives title to a bishop. It has extensive manufactures of sail-cloth, and a trade in leather, flax, and hemp. Its onions and garlic are celebrated. In its vicinity is a convent, founded 1444, one of the richest in the empire. Pop. (1884) 9,505; (1892) 10,091.

BORRELISTS, n. *bŏr'rĕl-ists* [from *Borrel*, the founder of the sect]: a Christian sect in Holland who reject the sacraments and other externals of Christian worship, combining this with austerity of life.

BORROMEAN ISLANDS, *bor-ro-mĕ'an*: group of small islands in the Lago Maggiore, n. Italy. They are in the western arm of the lake, called the Bay of Tosa, and are named after the family of Borromeo, which for centuries has been in possession of the richest estates in the neighborhood. They are sometimes called also *Isole dei Conigli*, on account of the number of rabbits found on them. They were little more than naked rocks, till Vitaliano, Count Borromeo, master-general of ordnance to the king of Spain, about 1671, caused soil to be carried to them, built terraces, and converted them into gardens, the beauty of which and of their situation has won for them the name of the *Enchanted Islands*. The two most celebrated are *Isola Bella* and *Isola Madre*. On the w. side of *Isola Bella* stands a palace of the Borromeo family, containing many admirable paintings and other works of art. The *Salle terrene*, a series of grottos, inlaid with stones of various colors and adorned with fountains, connect the palace with the gardens, the terraced style of which gives to the whole island the appearance of a truncated pyramid; a colossal winged unicorn, the armorial device of the Borromeo family, crowning the whole. *Isola Madre* is laid out in the same terraced style, and is crowned by a castle. The odors of flowers from the islands, upon which grow many plants of tropical climates, are wafted far over the lake. The *Isola de' Pesca-*

BORROMEO—BORROW.

tori now contains a village of about 400 inhabitants, who subsist by fishing and smuggling.

BORROMEO, *bor-ro-mā'o*, CARLO, Count, Cardinal, Archbishop of Milan: saint of the Church of Rome: 1538, Oct. 2—1584, Nov. 3; b. at the Castle of Arona, on the Lago Maggiore, the family seat of his ancestors. He studied law at Pavia, and took the degree of doctor 1559. His uncle, Pope Pius IV., on being raised to the pontificate in 1560, appointed him to a number of high offices, notwithstanding his youth. B. showed great faithfulness and ability in governing Ancona, Bologna, and other parts of the States of the Church as legate, and in discharging the duties of offices connected with ecclesiastical administration at Rome. Surrounded with magnificence and luxury, he was always grave, pious, and rigid in his life, studious, and a patron of letters. His uncle, the pope, made him his grand penitentiary, and did nothing considerable without his co-operation. It was in a great measure by his influence that the re-opening of the Council of Trent was accomplished, and that its deliberations were brought to a conclusion so favorable to the papal throne. He committed its decrees to memory, had the principal part in drawing up the *Catechismus Romanus* for exposition of them, and proceeded to give all possible effect to them in his archiepiscopal province. B.'s exertions, not only for the improvement of ecclesiastical discipline, but also for the reformation of morals in the archbishopric of Milan, drew upon him the hostility of the monastic orders, and also to some extent that of the Spanish authorities in Milan, who were jealous of the extension of his jurisdiction. An attempt was even made upon his life in 1569. He spent great part of his income in beautifying the cathedral and other churches. With a view to provide well-qualified priests, he founded, 1570, the Helvetic College at Milan. He brought about an alliance of the seven Rom. Catholic cantons, known as the *Golden Borromean League*, for the united defense of their faith. In the famine of 1570, and during the plague in Milan 1576, he showed equal energy, benevolence, and devotedness, saving the lives of multitudes by prompt arrangements for relief. He died, exhausted by labors and austerities. Many supposed miracles at his tomb led to his being canonized 1616. His theological works were published at Milan 1747, 5 vols. folio. On the w. bank of the Lago Maggiore, in the neighborhood of his birthplace, is a colossal brazen statue of him.

His brother's son, Count Frederico Borromeo, b. 1563, also was a cardinal, and 1595–1631 abp. of Milan, and was the founder of the Ambrosian Library (q.v.)

BORROW, v. *bör'-rō* [AS. *borg* or *borh*, a surety, a loan—from AS. *beorgan*, to protect: Dut. *borg*, a pledge; Ger. *bürge*, a surety]: to obtain money on security; to solicit from another on loan; to receive on credit for a time; to imitate; to copy: N. in *Scot.* and *OE.*, 'a pledge.' **BORROWING**, imp. soliciting on loan: N. the act or practice of soliciting on loan. **BOR'ROWED**, pp. *-rōd*, used as one's own

BORROW—BORROWING.

which really belongs to another; assumed, as in manners or dress; fictitious; copied. BORROWER, n. -*er*, one who.

BORROW, *bôr'rō*, GEORGE: 1803–1881, July 30; b. Norfolk: English author. From his earliest years he had extraordinary talent for languages, and strong inclination for adventure. In his youth he lived some time among gypsies, acquiring an exact knowledge of their language, manners, and customs. His travels as agent for the British and Foreign Bible Soc. through almost all countries of Europe and a part of Africa, made him familiar with many modern languages, even to their dialectic peculiarities. Whatever was little known had peculiar charms for him, and he shrunk from neither toil nor danger. True to his youthful predilection, he made the gypsies scattered over every part of Europe one of the principal subjects of his study. His first work, *The Zineali, or an Account of the Gypsies in Spain* (2 vols. Lond. 1841), made a favorable impression by its lively and dramatic style. It was followed by *The Bible in Spain* (2 vols., Lond. 1843), a book to which chiefly its author is indebted for his celebrity, and which consists of a narrative of personal adventures, in which the graphic power of the style amply compensates for the rather unmethodical arrangement of the book. After a long interval, B. published a work long before announced, *Lavengro, the Scholar, the Gypsy, and the Priest* (3 vols., Lond. 1851), generally regarded as an autobiography, with a spice of fancy mingling with fact. The principal character is depicted with extravagant exaggeration; and the somewhat bizarre originality which gave a peculiar zest to the author's earlier works here appears as mannerism. The book left the hero in the midst of his adventures, and was not continued until 1857, when B. published *The Romany Rye*, a sequel to *Lavengro*. He published *Wild Wales* 1862, and *Romano Lavo-Lil* 1874.

BORROWING, in Law: soliciting and receiving on loan. In the case of *money*, several legal applications of a general nature, regarding *bonds*, *mortgages*, and other similar *securities*, have to be considered: see these titles. More strictly, borrowing may be described as a contract under the law of *bailments* (see CONTRACT), and may be briefly and simply defined as asking or taking a loan. The essentials of this contract are, that there must be a certain specific thing lent, such as a book, an article of furniture, a horse, or it may be a house, land, or even an incorporeal right. But in the law of England the contract is confined to goods and chattels or personal property, and does not extend to real estate. Lord Chief-Justice Holt's definition described it as a borrowing of a thing *lent*, in contradistinction to a thing deposited, or sold, or intrusted to another for the sole benefit or purposes of the owner. Again, the borrowing must be gratuitous and for the borrower's use, which use must be the principal object, and not a mere accessory. Such use, too, may be for a limited time or for an indefinite period. The contract must be also of a legal nature, for if it is immoral, or against law, it is utterly void; this, however, is a necessary quali-

BORROWING DAYS.

cation of all contracts. Lastly, the property which is the subject of the contract must be borrowed or lent to be *specifically* returned to the lender at the determination of the agreement, in which respect it differs from a loan for consumption.

The persons who may borrow and lend are all those who can legally make a contract; a capacity, therefore, which excludes married women, unless they act with the consent of their husbands, when it binds the latter and not the wives.

It is not necessary that the lender should be absolute proprietor of the thing lent or borrowed; it is sufficient if he have either a qualified or a special property therein, or a lawful possession thereof. As to the borrower, he has the right to use the thing during the time and for the purpose intended, whether such intention is expressed or implied; but beyond this he cannot go. The following quotation from Mr. Justice Story's celebrated work on *bailments* (to which reference is generally made), is useful for popular information: 'A gratuitous loan is to be considered as strictly personal, unless, from other circumstances, a different intention may fairly be presumed. Thus, if A lends B her jewels to wear, this will not authorize B to lend them to C to wear. So, if C lends D his horse to ride to Boston, this will not authorize D to allow E to ride the horse to Boston. But if a man lends his horses and carriage for a month to a friend for his use, there, a use by any of his family, or for family purposes, may be fairly presumed; although not a use for the benefit of mere strangers.' During the period of the loan, the borrower has no property in the thing, but a mere right of possession and use of it. But notwithstanding, if the thing lent and borrowed be injured by a stranger, it would appear that the borrower may maintain an action for the recovery of damages; the mere possession of property without title being sufficient against a wrongdoer. See CONTRACT: LOAN: HIRE: and the titles above referred to.

BORROWING DAYS: name for the last three days of March, in Scotland and some parts of England. The popular notion is, that these days are borrowed or taken from April, and may be expected to consist of cold or stormy weather. Although this notion dates from a period before the change of the style, a few days of broken and unpleasant weather about the end of March still afford a sanction for old notions concerning the borrowing days. The origin of the term B.D. is lost in the mists of antiquity, though the conjecture may be hazarded that it has no higher source than the popular rhyme in which it is introduced as a poetic fiction. The most dramatic form of this rhyme in Scotland is as follows:

March said to April:

'I see three hoggs on yonder hill;

And if you 'll lend me days three,

I'll find a way to gar [make] them die!

The first o' them was wind and weet,

The second o' them was snaw and sleet,

The third o' them was sic a freeze,

It froze the birds' feet to the trees.

But when the borrowed days were gane,

The three silly hoggs came hirplin [limping] hame.

BORROWSTOUNNESS—BORY DE SAINT VINCENT.

The superstition respecting the B. D., though now little else than a jocular fancy, was so strong in Scotland in the 17th c., that when the Covenanting army, under Montrose, marched into Aberdeen 1639, March 30, and was favored by good weather, a minister pointed it out in his sermon as a miraculous dispensation of Providence in behalf of the good cause. See Gordon of Rothiemay's *History of Scots Affairs from 1637 to 1641*: also Brand's *Popular Antiquities*.

BORROWSTOUNNESS, *bör'-ro-stown-nēs'*, or **Bo'NESS**, *bō-nēs'*: seaport in Linlithgowshire, Scot., on a low peninsula on the Firth of Forth, 17 m. w.n.w. of Edinburgh. It has coal-mines extending under the bed of the Firth; and manufactures of salt, soap, malt, vitriol, and earthenware, and a trade in grain. Ironstone, limestone, and freestone are in the parish bounds. Graham's Dike, a part of the Roman wall of Antoninus, traverses it. Dugald Stewart lived near B. In 1880, 2,278 vessels, of 272,200 tons, entered the port, and 2,265, of 268,210 tons, cleared it. A new dock, with an area of $7\frac{1}{4}$ acres, was opened 1881. Pop. (1871) 4,986; (1881) 6,037. (1891) 4,519.

BORSAD: town in the n. division of the province of Bombay, district of Kaira. It is in the elevated region of Gujerat, 1,900 ft. above sea level, and is connected by railway with Bombay and Baroda. Pop. 13,000.

BORSIPPA, *bör-síp'pá*: town of ancient Baybylonia (now Koofa?), on the right bank of the Euphrates, about 8 m. s. of Hillah. Nebuchadnezzar inclosed B. within the walls of Babylon, and in cuneiform writings it is often mentioned in connection with that city. B. furnishes a celebrated Assyrian inscription, in cuneiform characters, now in the British Museum, London.

BORSOD, *bor-shod'*: county in Hungary, on both sides of the river Saja, tributary of the Theiss. It was named after the ancient castle of Borszod (now in ruins), and is one of the most fertile sections in the kingdom. It has copper, iron, and coal mines, and produces grain, excellent fruits, hemp, tobacco, and cheese. Cattle are extensively raised.

BORT, n. *bört*, or **BOORT**, n. *bürt*: a kind of impure diamond imported from Brazil, used for polishing other stones, and in the construction of the instruments for boring artesian wells.

BORY DE SAINT VINCENT, *bo-re'dēh sāng vang-sōng'*, **JEAN BAPTISTE GEORGE MARIE**: 1780–1846, Dec. 22; b. Agen, now in the dept. of Lot-et-Garonne: French traveller and naturalist. In 1798, he went with Captain Baudin on a scientific mission to New Holland, but separated from him before they reached their destination. On his return he wrote his *Essai sur les Iles Fortunées de l'antique Atlantide* (Par. 1803); and his *Voyage dans les quatre principales Iles des Mers d'Afrique* (Par. 1804). Having joined the army, he served at Ulm and Austerlitz, and on Soult's staff in Spain. He served as a colonel at Waterloo, and afterward had to retire to Belgium. At Brussels he edited, with Van Mons, the *Annales des Sciences Physiques* (8 vols.). He pro-

BORYSTHENES—BOSCAN-ALMOGAVER.

duced an admirable work on the subterranean quarries in the limestone hills near Maestricht (Par. 1821). He returned to France 1820, wrote for liberal journals, and for Courtin's *Encyclopédie*, etc. In 1827, appeared his *L'Homme, Essai Zoologique sur le Genre humain*. He wrote what relates to cryptogamic plants in Duperrey's *Voyage autour du Monde* (Par. 1828). He rendered an important service to science by editing the *Dictionnaire Classique de l'Histoire Naturelle*. When, 1829, the French government sent a scientific expedition to the Morea and the Cyclades, the first place in it was assigned to B. de S. V.; and the results of his researches were given to the world in the *Expédition Scientifique de Morée* (Par. and Strasb. 1832, etc.), and in the *Nouvelle Flore du Péloponnèse et des Cyclades* (Par. 1838). In 1839, he undertook the principal charge of the scientific commission which the French government sent to Algeria.

BORYSTHENES: see DNEPER.

BORZNA, *börz'ná*: a town of Russia, govt. of Tchernigov, 50 m. s. e. of the town of Tchernigov. Pop. (1880) 7,580.

BOS: see BOVIDÆ: OX.

BOS, LAMBERT: 1670, Nov. 23—1717, Jan. 6; b. at Workum, Friesland: Dutch philologist. He studied at the Univ. of Franeker, where, by the advice of Vitringa, he applied himself especially to the Greek language. In 1704, he was appointed Greek prof. in that univ. All his works are characterized by thorough scholarship and remarkable acuteness, and notwithstanding the advances of classical criticism since his day, some of them are still consulted, such as his *Vetus Testamentum ex Versione Septuaginta Interpretum* (Franeker, 1709; new ed., Oxford, 1805) his *Ellipses Græcæ* (Franeker, 1702), and particularly his *Antiquitatum Græcarum præcipue Atticarum Descriptio Brevis* (Franeker, 1714).

BOSA, *bō'sá*: town of the island of Sardinia, province of Cagliari, near the mouth of the Termo; lat. 40° 17' n., long. 8° 27' e. Notwithstanding its fine situation, partly on the side of a hill, and partly on a plain, it is unhealthful. It is surrounded by decaying walls; has an old castle, a cathedral, several monasteries and churches; and a trade in wine, oil, grain, and cheese. Its port admits vessels of small size. Pop. 6,500.

BOSCAGE, n. *bōs'kāj* [OF. *boscage*; It. *bosco*, a wood]: underwood; a thicket; a landscape in which thickets are painted. **BOSKET**, or **BOSQUET**, n. *bōs'kēt*, a grove; a bower. **Bos'ky**, a. *-kě*, wooded; shady.

BOSCAN-ALMOGAVER, *bōs-kán'ál-mo-gá-vär'*, **JUAN:** b. Barcelona, Spain, 1500; d. some time before 1544: poet. He was of an ancient noble family; received from his parents a careful education; and went to Granada, to the court of Charles V. The education of the celebrated Duke of Alba was afterward intrusted to him. He spent the latter part of his life at Barcelona, editing his own works and those of his friend Garcilasso de la Vega. He was the first to make use of Italian measures in Spanish verse, and thus became the crea-

BOSCAWEN—BOSCOBEL.

tor of the Spanish sonnet. By the introduction of various Italian forms, he made an epoch in Spanish poetry. His poems are still esteemed, but his other literary productions are forgotten. The best edition is that of Leon, 1549.

BOSCAWEN, *bos'ka-wen*, EDWARD: Admiral in the British navy: 1711–61; second son of Viscount Falmouth. He highly distinguished himself at the taking of Puerto-Bello, and at the siege of Carthagená, 1740. In 1744, Apr., he captured the French ship *Medée*, with 800 prisoners. He had an important share in the victory off Cape Finisterre (1747, May 3), and six months afterward received the command of the East Indian expedition; he showed high military skill in conducting the retreat from Pondicherry. He returned 1750, and in the following year became a lord of the admiralty. In 1755, he was again afloat, and intercepted the French fleet off Newfoundland, capturing two 64-gun ships and 1,500 men, including the French commander, Hoquart, whom he had twice before taken prisoner. Next year, as admiral of the blue, he was appointed commander-in-chief of the powerful expedition against Cape Breton, as the fruit of which that island and St. John's were taken after some hard fighting. B. crowned his career by his signal victory over the French Toulon fleet, in the Bay of Lagos, 1759, Aug. 18. On his return home, he received the thanks of parliament, a pension of £3,000 a year, a seat in the privy council, and the command of the marines. Lord Chatham is said to have testified that when he proposed expeditions to other commanders he heard only of difficulties, but when he applied to B., he found him ready with suggestions and expedients.

BOSCH, *bosk*, HIERONYMUS DE: 1740, Mar. 23—1811, June 1: b. Amsterdam: unquestionably the most distinguished Latin poet of recent times, and a philologist of varied acquirements. His *Poemata* first appeared at Leyden, 1803 (2d ed., Utr. 1808). He rendered an important service to classical literature by his edition of the *Anthologia Græca*, with a metrical translation by Hugo Grotius never before published (4 vols., Utr. 1795–1810, to which Van Lennep added a fifth vol., Utr. 1822). His Discourses and Treatises on subjects of literature, mostly in Dutch, show profound learning, excellent judgment, and refined taste.

BOSCH-BOK, *bōsh'bók*: one of the s. African kinds of antelopes, inhabiting dense thickets. It is very shy, and is said to make a sound like a dog barking.

BOSCHISMEN, n. plu. *bōsh'is-mēn* [Dut. *bosch*, a wood; *men*, a man]: a word used by Professor Owen for *Bushmen*, or *Bosjesmen*.

BOSCH-VARK, *bōsh'vark*: bush-hog of s. Africa: see Hog.

BOSCOBEL, *bōs'kō-bēl*: an extra-parochial liberty of England, in the county of Shropshire, about 6 m. e.n.e. of Shifnal. The population of B. is only about 20, but the place is interesting in connection with the escape of Charles II. after his defeat at Worcester, 1651. After the battle,

BOSCO REALE—BOSCOVICH.

Boscobel House being proposed as a secure retreat, thither Charles turned his steps. At White-Ladies, a seat of the Giffard family, which was reached in the early morning, the king had his long hair cut, his hands and face smeared with soot; and for his royal dress he substituted the green and greasy suit of a countryman, and a leathern doublet. Thus disguised, Charles passed through a secret door into a neighboring wood, in the thickest part of which he sat shivering in the rain until dusk, when he stole out, and with a guide endeavored to reach Wales, where it was thought he would be safer than at Boscobel. They reached a royalist's house at Madeley, on the banks of the Severn, at midnight, and it was then found that they could not escape to Wales on account of the vigilance of the Puritans; and once more, after a day's rest in a stable loft, the king started for Boscobel wood, where he arrived about five o'clock in the morning. He immediately, with Major Carlis, who had led the forlorn-hope at Worcester, ascended a thick pollard oak, from which they could watch at intervals during the day the Roundheads in search of them passing by unaware of their near presence. In the evening, they descended, and made their way to the manor-house, where the king remained hidden two days. After other adventures Charles contrived to escape from England, Oct. 17.

BOSCobel TRACTS is the title of certain contemporaneous writings, first published 1662, giving a graphic description of this passage of the monarch's life. The authorship is generally attributed to Thomas Blount, a loyal gentleman of Worcestershire; but Nash, his grandson, in his history of Worcestershire, denies that they were his, on the authority of Blount himself.

BOSCO REALE, *bōs'kō rā-āl'lā*: town of s. Italy, province of Naples, at the s. base of Mount Vesuvius, 10 m. e.s.e. of Naples city. It contains several churches and convents. Good wine is produced in the neighborhood, and much silk. This town was in imminent danger of destruction by the eruption of Vesuvius 1850, when a stream of lava advanced toward it with a front of about a mile and a half broad, and a depth of about 12 ft. enveloped the town, and consumed the wood on both sides of it, in which were many magnificent oak, ilex, and ash trees. The larger trees, as they were enveloped in the lava, poured out jets of hissing steam from every knot and branch, and then exploded with a loud noise, leaping into the air to the height of 10 or 20 ft. Pop. 5,000.

BOSCO TRE-CASÉ, *bōs'kō trā-ká'sā*: town of Italy, at the s. base of Mount Vesuvius. It has several churches and convents, and a royal manufactory of arms and gunpowder. Wine and silk are raised in the district. Pop. 2,500.

BOSCOVICH, *bos'ko-ritch*, ROGER JOSEPH: 1711, May 18—1787, Feb. 12; b. Ragusa, Austria. celebrated mathematician and astronomer. He entered at an early age into the order of the Jesuits, and spent his life in scientific pursuits and important public labors. Before the completion of his course of studies in Rome, he was appointed teacher

BOSH—BOSIO.

of mathematics and philosophy in the *Collegium Romanum* there. The pope gave him a commission to measure a degree of the meridian in the States of the Church, which he accomplished 1750–53. In 1764 he was appointed to a professorship in Pavia, but after some time retired from this office. He was subsequently appointed prof. of astronomy and optics in the Palatine schools at Milan, and superintended the erection of the observatory in the Brera College, upon which he spent money of his own. After the dissolution of his order, he went to Paris 1774, and received a pension from the king. B. afterward went to Bassano, to superintend an edition of his works, on the completion of which he returned to Milan, but fell into a depression of spirits, which at last grew into complete insanity, in which he died. His works include dissertations on a great variety of important questions in mathematical and physical science, and were published collectively under the title *Opera Pertinentia ad Opticam et Astronomiam* (5 vols., Bassano, 1785). His name is connected with a theory of physics, first published in his *Philosophiæ Naturalis Theoria, Redacta ad Unicam Legem Virium in Natura Existentium* (Vienna, 1758). He was also a poet, and his Latin poem, *De Solis ac Lunæ Defectibus* (London, 1764), has been much admired.

BOSH, n. *bōsh* [Turk. *bosh*, empty, vain: compare Scot. *boss*, hollow, empty]: silly nonsense; idle talk.

BOSH-BOK: see BOSCH-BOK.

BOSHES, n. *bōsh'ēz* [Ger. *böschung*, a slope]: the sloping sides of the lower part of a blast furnace, which gradually contract from the belly, or widest part of the furnace to the hearth.

BOSH-VARK: see BOSCH-VARK.

BOSIO, *bo'ze-o*, FRANÇOIS JOSEPH, Baron: 1769–1845, July 29; b. Monaco, in Sardinia: sculptor. He studied at Paris; and when only 19, returned to Italy, where he executed a multitude of commissions even at that early age. His reputation was greatly increased by the figures which, at the request of Napoleon, he executed for the column in the Place Vendôme. Louis XVIII. and Charles X. also patronized B., the former appointing him royal sculptor, the latter elevating him to the rank of baron. He had also several professional honors, being director of the Acad. of Fine Arts in Paris, and member of the Berlin Acad. of Arts. B.'s principal works are: the *Hercules* in the garden of the Tuileries; the incomparably beautiful *Hyacinth* in the Luxembourg; the *Nymph Salmacis*, a figure of wonderful grace and purity of outline; an allegorical figure of France, 7 ft. high, surrounded by the Muse of History and a group of Genii; the statue in memory of the Duc d'Enghien; the equestrian statue in the Place des Victoires, and the monument of Count Demidov, 30 ft. high, composed of six figures, with bas-reliefs, etc. Besides these, B. executed a great multitude of busts of distinguished persons, such as the Emperor Napoleon, the Empress, Queen Hortensia, the king and queen of Westphalia, Louis XVIII., Charles X..

BOSJESMAN—BOSNIA.

etc. B.'s works all are marked by grace of form, harmony of design, and elegance of finish. His style generally reminds one of Canova.

BOSJESMAN, n. *bōs'jēs-măn*: the Dutch equivalent of Bushman, or wild man of the woods—a name applied to one of the Hottentot tribes of south Africa n. of the Cape Colony, low in the scale of civilization: see **BOSCHISMEN**: **BUSHMEN**.

BOSKET, or **BOSQUET**, *bos'kět*, or **BUSKET**, *būs'kět* [F. and Prov. *bosquet*]: a grove; a compartment made by branches of trees regularly or irregularly disposed.

BOSKY, a. *bōsk'ī*: bushy; woody; covered with boscage or thickets.

BOSNA-SERAI, *bōs-năt-sēr-ī'*, or **SERAİO**, *sê-rī'o*, or **SARAJEWO**, *sê-rī-yă'vo* (Ital. *Seraglio*): cap. of the province of Bosnia (q.v.); beautifully situated in the midst of gardens on both sides of the Migliazza, an affluent of the Bosna, about 122 m. s.w. of Belgrade. Of its inhabitants the majority are Christian Bosniaks, the others Moslems and Jews. Four handsome stone bridges cross the river at different points of the city, which is adorned with many churches and mosques (among them a Christian cathedral), whose gilded domes and whitened minarets and spires give it quite an oriental appearance. B. has a palace built by Mohammed II., and an old castle on a height, erected 1263 by the Hungarian general Cotroman; its old walls are decayed, and it is now of no military importance. B. has manufactures of tin, iron, and copper goods, and trade in dyeing. Its position makes it an important commercial entrepôt. It has also valuable iron mines and mineral baths in the vicinity. The city was taken and occupied by the Austrians after a sharp engagement 1878, Aug. Pop. (1895) 50,000.

BOSNIA, *bōz'nă-ă*: till 1878 a Turkish vilayet, now a province of the Ottoman empire occupied and administered by Austria. Till 1876 it included Herzegovina (q.v.), and still comprises the hitherto Turkish parts of Croatia and Dalmatia. It is bounded n. by the Save and Unna; e. by the Vrina, the mountain-chain of Jublanik, and a branch of the Argentaric Alps; s. by the Scardagh mountains; and w. by the mountains of Cosman, Timor, and Steriza. At a few points in the s. it reaches to the Adriatic sea. Area, 20,000 sq. m. With the exception of the n. tract, extending along the Save, it is everywhere mountainous, and is traversed by more or less elevated ranges of the Dinaric Alps, whose highest peaks rise from 5,000 to 7,700 ft. above the sea, and are covered with snow from Sep. to June. The mountain slopes are for the most part thickly covered with forests of oak, beech, lime, chestnut, etc., of magnificent growth, and only here and there exhibit meadows, pastures, and cultivated spots. The principal river of the country is the Save, on the n. border, into which flow the Unna, the Verbas, the Bosna, and the Drin. The Narenta and the Boyana fall into the Adriatic. The air is salubrious, the climate tem-

BOSNIA.

perate and mild. It is only in the plain that agriculture is carried on to a considerable extent; grain, maize, hemp, vegetables, fruits, and grapes are produced in great abundance; and their cultivation would be much more extensively and actively prosecuted, but for the heavy impositions laid upon this branch of industry by the Turkish government. Game and fish abound, as well as wild animals, such as bears, wolves, lynxes, etc. The country is celebrated for the breeding of sheep, swine, goats, and poultry; and bees, both wild and tame, are very numerous. In 1891 the imports aggregated \$7,706,800; exports \$7,277,176; principal imports, food, metal, and machinery; principal exports, animals and animal products, dried fruit, and staves. The budget estimates 1892 were, revenue \$3,458,662; expenditure \$3,419,656. B. and Herzegovina together had 1 higher gymnasium, 2 gymnasia, 4 commercial schools, 943 elementary schools, 1 normal school; and 384 m. of railway and 1,765 m. of telegraph lines. The population consists of Bosnians, Croats, Morlacks, Montenegrines, Turks, etc., the much greater part being of the Slavonian race. The Bosnians, or Bosniaks, who form about a third of the inhabitants, are partly Mohammedans (descendants of Slavonian Christians who changed their religion at the time of the Mohammedan conquest), and partly of the Greek and Rom. Cath. churches. They are brave, hardy, rapacious, and cruel; rude and repulsive toward strangers, yet among themselves they are peaceful and honest; they are also industrious, simple in their habits, and temperate. The Moslem women in B. are less secluded than in the other Turkish provinces, and have long enjoyed the liberty of appearing in public more or less veiled. The Croats, who form about a sixth of the population belong partly to the Greek and partly to the Rom. Cath. Church; only a few are Mohammedans. They are principally engaged in agriculture, the feeding of cattle, and the barter trade. The Morlacks, who number about 150,000, dwell mostly in the district of Herzegovina, and are courteous and clever in business. They are inveterate enemies of the Turks. Three-fourths of them are Greek Christians, and the rest Rom. Catholics. The Osmanli Turks in B. are but about 2,000 in number; the number of Greeks and Jews is between 20,000 and 30,000; the whole number of Christians is probably about two-thirds of the total population. B., in ancient times, was included in Pannonia; and previous to the 7th c., was governed by princes of its own, called Bans or Waiwodes, who became dependent on Hungary. Being conquered by the Turks, it was finally annexed to the Ottoman empire, 1522. A dangerous rebellion broke out, 1851. The insurrection which originated in Herzegovina, 1875, soon assumed the proportions of a national movement, and led to war between Turkey and Servia and Montenegro. The war of 1877-78 between Russia and Turkey followed; the treaty concluded at the close of it proposed to give B. administrative autonomy, but the Berlin Conference of 1878 resolved that B. should be occupied and administered by Austria (the sanjak of Novi-Bazar being put under special arrangements). The

BOSOM—BOSPORUS.

Bosnians sympathized with and supported the Anti-Austrian and Pan-Slavonic rising in Herzegovina and Dalmatia, 1382. Pop. of B. and Herzegovina (1895) 1,568,092.

BOSOM, n. *báz'ŭm* [AS. *bosum*, bosom: Ger. *busen*; Dut. *boezem*, a bosom]: the breast of a human being and the parts adjacent; the clothes about the breast; the seat of the passions; embrace: retreat; asylum; in *OE.*, wish; desire: ADJ. intimate; dear; confidential: V. to conceal; to cherish; to preserve with care. **BOS'OMING**, imp. **BOS'OMED**, pp. -*ŭmd*.

BOSPORUS, n. *bös'pō-rŭs* (of which *Bosphorus* is an ancient and common variation) [L.—from Gr. *bospōros*, the heifer's ford—from Gr. *bous*, heifer; *poros*, a ford]: a narrow sea; a strait. **BOSPO'RIAN**, a. -*rŭ-ăn*, pertaining to. It is the ancient name of the channel which separates Europe from Asia, and connects the Black Sea with the Sea of Marmora. The name, which signifies Ox-ford or Cow-ford, was given to it because here, according to the legend, Io, transformed into a cow, swam across; or, as is very generally supposed, because it is so narrow that an ox might swim across. Afterward, as the same name was bestowed upon other straits, this was designated the *Thracian Bosphorus*. Its s. and n. entrances have two light-houses each. Its shores are elevated, and throughout its length the strait has 7 bays or gulfs, with corresponding promontories on the opposite side. One of these gulfs forms the harbor of Constantinople, or, as it is often called, the Golden Horn. The length of the Thracian B. is about 17 m., with a breadth of from little more than a third of a mile to two miles. At the middle of this strait, where it is about 2,800 ft. in breadth, Darius made his bridge of boats when he marched against the Scythians. The B. has long been under Turkish control. Repeated European conferences, including that of Berlin, 1878, have confirmed the stipulation of the treaty made 1841, providing that no ship of war belonging to any nation but Turkey shall pass the B. without the consent of the Ottoman authorities.

CIMMERIAN BOSPORUS was the name given by the ancients to the Strait of Kaffa (q.v.), also called the Strait of Yenikalé or of Theodosia, on the e. coast of the Black Sea. The country on both sides of the Cimmerian B. formed, in ancient times, the kingdom of Bosphorus, founded B.C. 502. In B.C. 393 the kingdom was extended along the Asiatic coast; and Theodosia was united with it B.C. 360. The kingdom became tributary to the Scythians B.C. 290; and B.C. 116, Mithridates, King of Pontus, vanquished the Scythians, and set his son, Machares, on the throne of Bosphorus. On the death of Machares, soon followed by that of Mithridates, the Romans gave the country, B.C. 63, to Pharnaces, second son of Mithridates, and after his assassination, to several princes who gave themselves out for descendants of Mithridates. When at last the family became extinct, A.D. 259, the Sarmatians made themselves masters of the kingdom, from whom the inhabitants of the Chersonesus took it 344. With Tauric Chersonesus, it afterward formed a part of the Eastern Roman empire, until the Chazars

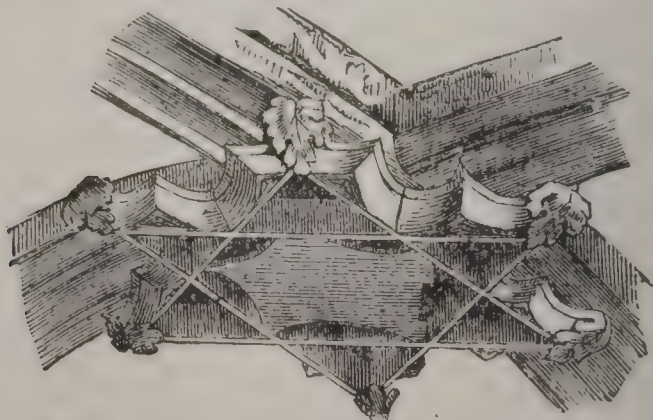
BOSQUET—BOSS.

and afterward the Tatars, under Mongolian princes, made themselves masters of it. See TAURIDA.

BOSQUET, *bos-kā'*, PIERRE FRANÇOIS JOSEPH, Field-Marshal of France: 1810, Nov. 8—1861; b. Mont de Marsan, dept. of Landes. He entered, 1829, the Polytechnic School at Paris, and 1833 joined the artillery as sub-lieut. In 1834, June, he went with his regt. to Algeria, where he became conspicuous for military tact, energy, and valor. In 1847, he had attained the rank of col., and the following year he was named gen. of brigade by the republican government. In the end of 1853, he returned to France, and 1854 was appointed by the emperor gen. of division. He had the command of the second division of the French army in the Crimea, and at the battle of the Alma, Sep. 20, his successful maneuvers against the Russian left wing were mentioned in Marshal St. Arnaud's dispatch to the emperor as deciding the fate of the day. At Inkermann, Nov. 5, he contributed greatly to the defeat of the Russians. His conduct on this occasion was noticed with praise by Lord Raglan in his dispatch, and the British parliament voted its thanks to him in a special resolution. He also took a leading part in the capture of the Malakoff, 1855, Sep. 8; but a wound from the bursting of a shell compelled him to retire to France. In 1856 he was made field-marshal.

BOSS, n. *bōs* [F. *bosse*, a bunch: Dut. *bosse* or *busse*, knob of a buckler: Ger. *bausch*, a projection: compare Scot. *boss*, hollow]: something raised from the surface; a protuberance; a stud or knob; in *geol.*, a rounded mass of rock that has resisted denudation, or a sudden protrusion of trap or other igneous rock; a short trough for holding mortar when tiling a roof; a frame of wood in the centre of a grain stalk to prevent heating. **BOSSSED**, a. *bōst*, studded; in *bot.*, having a rounded surface with a projecting point in the centre. **Bossy**, a. *bōs'sē*, raised. **Bos'ses**, n. plu. *-ēz*, projecting ornaments used in *arch.* in various situations. **BOSSAGE**, in *building*, a stone left rough, projecting from the general face of the wall, usually intended to be wrought into a decoration at some later time.

BOSS, n. *bōs* [Dut. *baas*, master]: a familiar slang word for an employer; a manager or superintendent; a master.



BOSS.—From Notre Dame la Riche, Tours.

BOSS, in *Architecture*: a raised ornament, covering the intersections of the ribs of ceilings. They are more fre-

quently seen in vaulted roofs, as in the aisles of a church, but occur also where the ceiling is flat. In early Norman work there are generally no bosses, and they become richer and more frequent as advance is made toward the decorated and perpendicular styles. In the decorated style the B. usually consists of foliage, sometimes combined with animals, heads, and the like. Coats-of-arms, charged with armorial bearings, came then also to be used for this purpose, though they were more frequent in the perpendicular. Bosses were frequent also on shields.—The B. of a bit is the ornament with which a bridle-bit terminates at each end. It was borne in the arms of the corporation of Lorimers: see LORIMER.



BOSSI, *bos'sē*, GIUSEPPE: 1776–1816; b. Busto-Arsizio 19 m. n.w. of Milan: painter and writer. He made remarkable progress in his literary course at the college of Monza, commenced the study of art at Milan, sojourned at Rome, where he became an associate of Canova, and, on his return to Milan, became sec. of the Milan Acad. When Napoleon was in Milan in 1805, B. put on exhibition pictures of *Aurora and Night*, *Edipus and Creon*, *The Italian Parnassus*, and M. Angelo's *Last Judgment*. He made also a copy of Leonardo's *Last Supper*, then almost obliterated. Besides a number of sonnets and canzones, he wrote *Il Cenacolo di Leonardo da Vinci*, as remarkable for taste as for erudition, which Goethe has translated into German.

BOSSI, LUIGI: 1785–1835, Apr. 10; b. and d. Milan: Italian archeologist and historian. He studied at Pavia, and became a canon of the cathedral of Milan; but when the French entered Italy, he took the side of the invaders, and was appointed by Bonaparte agent of the French govt. at Turin, and afterward prefect of the archives of the kingdom of Italy. He was an extremely prolific author, and, dealing with such a multitude of various subjects, he has not escaped criticism. He produced more than 80 works, great and small, including theological and religious works, dissertations on antiquarian subjects, historic works, works on subjects connected with the fine arts, tragedies, comedies, etc. His *Introduzione allo Studio delli Arti del Disegno*, is instructive and much esteemed. His most important historic works are a much enriched translation of *Roscoe's Life of Leo X.* (12 vols., Milan, 1816–1817); *Researches concerning Christopher Columbus* (Milan, 1818); and a *History of Italy* (19 vols., Milan, 1819–1823).

BOSSUET, *bo-sū-ā'*, JACQUES BÉNIGNE: 1627, Sep. 27—1704, Apr. 12; b. Dijon: French pulpit orator: received his earlier education in the Jesuit college at Dijon, then went to Paris to the College of Navarre, where he studied the Sacred Scriptures, the works of classical antiquity, and the Cartesian philosophy. In 1652, he was made a doctor of the Sorbonne, and a canon in Metz. Here he was called by the bishop to reply to the Catechism of the Prot. minister, Paul Ferri, and this he did in a way that commanded the admiration even of Protestants. He soon attained great distinc-

tion as a pulpit orator, and 1661 he was made preacher to the court. His discourse on the occasion of Marshal Turenne's conversion to the Rom. Cath. church obtained for him the bishopric of Cordan. The king having, 1670, intrusted to him the education of the Dauphin, he resigned his bishopric 1671, because he believed that he would be unfaithful to his duty if he retained it during a continued absence from his diocese. He was now made a member of the Acad. The care with which he attended to the education of the Dauphin was rewarded, 1680, by his nomination as first almoner of the Dauphin, and 1681 by his appointment to the bishopric of Meaux. He was the author of the four articles, which secured the freedom of the Gallican Church, and the rights of the king in regard to it, against the aggressions of the pope; and his eloquence in the Assembly of the French clergy, 1682, obtained their adoption of these articles. In 1697, he became a member of the council of state, and in the following year first almoner to the Duchess of Burgundy. He spent the last year of his life in his diocese. He was strict alike in morals and in religious doctrine: his strictness in the latter he showed particularly in his controversy with Fénelon (q.v.) whom he accused of heresy for his defense of the Quietists (q.v.). His style is vigorous and artistic. His orations at the funerals of the Duchess of Orleans and the great Condé are particularly noted as master-pieces of this kind of eloquence. All his writings attracted much attention. For the defense of those dogmas of the Rom. Cath. Church which are rejected by Protestants, he wrote his *Exposition de la Doctrine de l'Église Catholique sur les Matières de Controverse* (Par. 1671). His greatest controversial work is his celebrated *Histoire des Variations des Églises Protestantes* (2 vols., Par. 1688), in which he founds his argument chiefly upon the doctrinal diversities of the churches of the Reformation. To the defense of the four articles of the Gallician Church he devoted his *Defensio declarationis celeberrimæ, quam de Potestate Ecclesiæ sanxit clerus Gallicus a. 1682* (2 vols., Luxemb. 1730). With a view to the instruction of the Dauphin, he wrote his *Discours sur l'Histoire Universelle jusqu'à l'Empire de Charlemagne* (Par. 1681), a work particularly deserving of notice, as the first attempt at a philosophical treatment of history. The continuation of it to the year 1661 (Par. 1805) is entirely derived from materials which he left behind him, but to which the last touch of his own hand was wanting. Another fruit of his political and historical studies, was the *Politique tirée de l'Écriture Sainte* (Par. 1709). The most complete edition of his works is that published under the care of the Benedictines (46 vols., Versailles, 1815-19.)

His nephew, JACQUES B., d. Bishop of Troyes, 1743, July 12. His extensive correspondence, chiefly devoted to the elucidation and investigation of the views of Fénelon, is included in the above-mentioned edition of the works of his uncle.

BOSSUT, *bo-sü'*, CHARLES: 1730, Aug. 11—1814, Jan. 14; b. Tartaras, near Lyon, France: mathematician and natural

philosopher. So early as the year 1752, he became prof. of mathematics in Paris, and 1768 was received into the Acad. of Sciences. The revolution deprived him of his situation and his income, and he lived in the greatest seclusion, and and in almost misanthropical discontentment, till under the Empire he was appointed a prof. in the Polytechnic School. His works are very numerous. The following are particularly valuable: *Recherches sur la Construction la plus avantageuse des Digue*s (Par. 1764); *Recherches sur les Altérations que la résistance de l'éther peut produire dans le Mouvement des Planètes* (Par. 1776); *Nouvelle Expérience sur la Résistance des Fluides par d'Alembert, Condorcet, et Bossut* (Par. 1777); *Traité élémentaire de Mécanique et de Dynamique* (Charleville, 1763); *Cours Complète des Mathématiques* (7 vols., Par. 1795–1801); *Cours de Mathématique à l'Usage des écoles Militaires* (2 vols., Par. 1782); *Essai sur l'Histoire Générale des Mathématiques* (2 vols., 2d ed., Par. 1810), one of the best works on the history of mathematics; and *Traité du Calcul Différentiel et Intégral*. All his works are distinguished by methodical arrangement and great clearness. He was a great admirer of Pascal, and edited his works (15 vols. Par. 1779), to which he prefixed an introductory *Discours sur la Vie et les Ouvrages de Pascal*.

BOSTAN (EL), *él bos-tän'*, or ALBOSTAN: town of Asiatic Turkey, pashalic of Marash, in a plain on the Sihun, on the n. side of Mount Taurus; lat. 38° n., long. $36^{\circ} 23'$ e. B. can be surrounded with water on the approach of an enemy; it has several mosques, and a considerable trade in wheat. It occupies the site of the Cappadocian Comana, which had a celebrated temple dedicated to a deity 'supposed to have been called *Ma* in the language of the country, and to be the moon-goddess.' Pop. 8,000–9,000.

BOSTANJI, *bös-tän'jē*: class of men in Turkey who, originally the sultan's gardeners (the name being derived from *bostan*, a garden), now perform, in addition, a variety of duties, such as mounting guard at the seraglio, rowing the sultan's barge, and attending on the officers of the imperial household. They are under a chief called Bostanji Bashi, who holds the rank of pasha, and is governor of the sultan's residences, and steersman of his barge. He holds also the inspector-generalship of the woods and forests in the vicinity of the capital, has the jurisdiction of the shores of the Bosphorus and Sea of Marmora, and is, altogether, so important a functionary that only personal favorites of the sultan can hope to fill the office. The financial reforms of Sultan Mahmoud, however, have greatly lessened the emoluments of the post. The B. at one time amounted to 5,000, and were divided into companies like the janissaries, with whom they were united in military duty. In war time, their strength was 12,000. A scarlet bonnet, of excessive dimensions, formed the distinctive part of their costume. Their number now does not amount to more than 600.

BOSTON.

BOSTON: capital of Massachusetts; in Suffolk co.; lat. $42^{\circ} 21' \text{ n.}$, long. $71^{\circ} 4' \text{ w.}$; 190 m. n.e. of New York, at the w. end of Massachusetts Bay, on an inlet which, whether for defense or for trade, forms one of the best harbors in the world. Boston Harbor has an area of about 75 sq. m. On the e. or seaward side, it is nearly inclosed between two headlands, and the space intervening is mostly occupied with islands, which leave between them only three practicable entrances. Its approaches are easy and safe, its entrances sufficiently wide and deep. Its large interior waterspace is divided by chains of islands in such a manner that ample roadsteads, sufficiently deep for the largest vessels, are easy of access, yet sheltered and tranquil. Five hundred ships of the largest class could anchor within them. On three of the islands are fortifications, Forts Independence, Warren, and Winthrop, of which only the last, on Governor's Island, is of modern character. The climate of the region is trying in winter. Mean annual temperature at B., 48° F.

The original portion of the city of Boston occupies a peninsula extending toward the n.e. at the w. extremity of the harbor, and bounded on the w. by the estuary of the Charles river. Its original area, 783 acres, has been increased by 1,046 acres by reclamations from the water, especially at the Neck, once the narrowest, now the widest part of the peninsula. In recent years especially, the area under the city government has been increased by the annexation of adjoining cities and towns or parts of towns—South Boston 1804, East Boston 1830, the city of Roxbury 1867, the town of Dorchester 1869, the city of Charlestown and towns of Brighton and West Roxbury 1873—till it comprises 27,251 acres, or nearly 45 sq. m. The reclamations on the w. side of the Neck form the Back-Bay district, now the fashionable section for residences. The surface both of old B. and of the districts annexed is much diversified. Three hills at the w. of the peninsula gave it its original name of Trimountain or Tremont, the Indian name having been Shawmut. These now form one, called Beacon Hill; at the n. end is Copp's Hill; Fort Hill, on the e. side, was levelled 1869, and subsequently used to fill up flats elsewhere. In the very heart of the city is the Common, which from the earliest times has been reserved to the public, and is now a beautiful park of 43 acres; fine rows of old elms adorn the malls which form its borders. Adjoining it is the Public Garden, of 24 acres, elaborately laid out. An opportunity was first afforded by the recent annexations for the creation of a more extensive but more remote system of public parks. Commonwealth Avenue, a magnificent street with park-like centre, connects these parks with the Public Garden. They are to contain over 1,100 acres, and to include an embankment along the Charles, a Back-Bay park, a tract bordering the beautiful Jamaica Pond, an extensive arboretum already existing, and a spacious and picturesque natural park in the West Roxbury district. In 1894, there were 70 public parks and squares, the total cost of which then was \$9,414,725. In the general appearance of

B., one of the most striking elements is the irregularity of the streets, an inheritance from colonial times, strongly contrasting with the checkerboard plan common in American cities. The original narrowness and crookedness has been to some extent removed by recent extensions, widenings, and improvements; the present configuration, not inconvenient to the practiced inhabitant, has undeniably a quaint picturesqueness and charm. B. was the first city in the United States to give attention to its architectural appearance, and is perhaps at present architecturally the handsomest large city in the country, excepting Washington with its public buildings. Substantial construction and finished appearance prevail. The finest section of residences grows yearly more beautiful. In the business portion of the city unusual opportunities were presented by the necessity of rebuilding the great 'burned district' left by the fire of 1872. The chief material used in the city is red brick, but granite also is abundant, and there is much use of various kinds of marble and sandstone. Beside railroad bridges, ten bridges for ordinary travel connect B. with Charlestown, Cambridge, and South Boston. The first of these, the Charles river bridge to Charlestown, 1,503 ft. long, was completed 1786, a great work for those days.

Of the public buildings of B. belonging to the United States government, the most important is the great Post-office and Sub-Treasury building, recently completed, at a cost of nearly \$6,000,000. This is one of the most imposing edifices in the city. It is built of Cape Ann granite, in the Renaissance style. It accommodates the post-office, the sub-treasury, the pension office, the internal revenue office, and the United States courts. The custom-house, a massive granite structure, was finished 1847; it was the costliest public building of its time. The principal building belonging to the state government is the State House, on the summit of Beacon Hill, overlooking the common; its gilded dome is one of the most conspicuous objects to any one approaching the city. By its prominence, fancifully suggesting the hub of a wheel, it has given occasion to the jocular saying (in allusion to the good opinion which Bostonians hold concerning their city) that, to the Boston man, 'Boston State-House is the Hub of the Universe.' The State House was built 1795, and is still a handsome and effective structure. It accommodates the executive and legislative branches of the state government, and contains interesting statues and memorials, and the state library. The central offices of the city government are in the City Hall. The most interesting buildings however, are Faneuil Hall and the Old State House. The original edifice of Faneuil Hall, the famous 'Cradle of Liberty,' was built 1740, and given by Peter Faneuil to the town for a town-hall; it was burned 1761, rebuilt 1762. It was the scene of the most exciting public meetings in the times preceding the Revolution, and has been used for similar purposes in all times of public excitement since. The Old State House is of not inferior historical interest. Built as a town-house 1748, it was successively the quarters of the colonial courts and legislature, the state house, and

the city hall. It has been carefully restored to its original condition, and contains an interesting collection of antiquities. A new court-house, of great extent, is now being erected to accommodate the sessions of both the state and the city courts. It will be the largest public building in the United States, outside of Washington. The old court-house was the scene of the Anthony Burns riot 1854. B contains a number of statues exceptional in an American city; some of them are of much merit; most of them represent the eminent public men of Massachusetts—Winthrop, Franklin, Samuel Adams, Prescott, Quincy, Webster, Everett, Mann, Sumner, Andrew. Of monuments, much the most famous is Bunker-Hill Monument, a granite obelisk 220 ft. high, erected 1825-43, on the summit of the hill on which occurred, 1775, June 17, the first great battle of the Revolutionary war. As landmarks of the earlier days of the city, there remain few of the old houses of two hundred years ago, and a few of the mansions of a later time. The oldest of the old burial-places are the King's Chapel burying-ground, in which are the remains of Gov. Winthrop and other early worthies, the Old Granary burying-ground, containing the remains of more distinguished personages than any other in the city, and the burying-ground on Copp's Hill. The cemeteries now used all are outside the limits of the old city. The numerous public baths of the city, which was the first to establish free public baths, deserve mention; they are floating swimming-baths.

In 1894 there were 267 churches, divided denominationally as follows: Congl. Trinitarian 44; Rom. Cath. 36; Prot. Episc. 34; Bapt. 31; Meth. Episc. 31; Congl. Unitarian 28; Univ. 10; Presb. 9; Hebrew 8; Luth. 8; Meth. 3; Advent 2; Christian 2; Ref. Episc. 2; Spiritualist 2; Swedenborgian 2; Friends 1; Ref. Church 1; Scientist 1; and miscellaneous 12. Christ Church, at the North End, is the oldest church-building, and remains unmodernized. It was built 1723, and is said to have been the church from whose belfry the lanterns were hung out for Paul Revere. In the Old South Church, built 1730, many of the most stirring town-meetings of the Revolution were held; it is now occupied by an exhibition of historical and Revolutionary relics. King's Chapel, established as Episcopal, now Unitarian, built 1753, also is of interest. Of modern churches, Trinity Church is undoubtedly the finest ecclesiastical edifice in New England, and one of the finest in the country. It is in the French Romanesque style, with a great central tower, 211 ft. high, and with interior decorations of extreme beauty. Near it is the new Old South Church, a superb structure. The new building of the Unitarian Association also is beautiful.

B. contains nearly 20 hospitals, and 30 asylums and charitable homes. Of the former, the chief are the City Hospital, mainly for the gratuitous treatment of the poor, and with a capacity of over 500, and the Massachusetts General Hospital, a model institution of great extent and completeness, with an endowment of about \$2,500,000. The McLean Asylum for the Insane, at Somerville, is a branch of this

Institution. Of other asylums, the Perkins Institution and Massachusetts School for the Blind, in South B., is one of the most important; it was here that the famous Laura Bridgman was educated. The number of private charitable and benevolent societies in B. is very great, probably 200 at present, with a capital estimated in 1893 at \$20,000,-000. Other city charitable institutions are the House of Industry, House of Reformation, Truant School, and Home for Paupers, all on Deer Island; the Lunatic Asylum; Marcella St. Home; Home for Paupers, on Rainsford's and Long islands; and the Almshouse, in Charlestown. Suffolk co. maintains a model House of Correction. These institutions 1893, Jan. 31, had 3,603 inmates; cost for maintenance in previous year \$660,794; and had income \$99,583. In 1892-3 the city supported 769 insane and feeble-minded persons.

A great variety of literary, scientific, medical, and missionary societies are to be found in B., which has always been famous for its devotion to reformatory and scientific specialties, and to 'isms,' so called. Literary coteries, however, are not now so influential as in the days when transcendentalism and abolitionism were in vogue. As specimens of organizations having their head-quarters here, the American Acad. of Arts and Sciences, the Archæological Institute of America, the Mass. Historical Soc., the Mass. Horticultural Soc., the Mass. Medical Soc., and the New England Historic-Genealogical Soc., may be mentioned. Most of the societies mentioned issue important publications, and have valuable special libraries. The city has also many clubs and club-houses, some of which are of great elegance. Of late years political clubs of a sort peculiar to B. have been in vogue. These are clubs whose meetings usually, if not exclusively, take the form of a social dinner, at which men of prominence in state or national politics are invited to be present and to speak. There are nine theatres in B., none of which have any great architectural pretensions as to exterior. The Boston Theatre, one of the largest and finest theatres in the United States, has a seating capacity of 3,000. The Boston Museum, the oldest of the existing theatres, is noted for a permanent company of comedians of high merit, and for finished performances in standard English comedy. In the department of art the principal institution of the city is the Museum of Fine Arts, occupying a handsome building in the Italian Gothic style, with elaborate terra-cotta designs, near Trinity Church. The lower story contains a large and valuable collection of Egyptian, Cypriote, Greek, Etruscan, and Roman antiquities, and of casts of antique and specimens of modern sculpture. The second story is assigned to a fine collection of paintings, drawings, and engravings, and to textiles, furniture, pottery, porcelain, glass, etc. The city has also other public and many private collections of works of art. There are schools of drawing and painting maintained in the Museum of Fine Arts, schools of painting on porcelain, and of art needlework connected with the Soc. of Decorative Art, a school of sculpture, a state normal art school, etc. The city now has a considerable number of painters, sculptors

and art clubs. There are also many musical clubs, several singing clubs of men being especially prominent. The Handel and Haydn Soc., founded 1815, is devoted to the production of oratorios. Of late years an extended series of symphony concerts, by the Boston Symphony Orchestra, has been one of the principal elements of the city's musical life each winter. There is a large and handsome music hall, which seats 2,600. It formerly contained a great organ of 5,474 pipes, but this has now passed into the possession of the New England Conservatory of Music. This conservatory, said to be the largest institution in the world for musical instruction, in all branches, was established 1867, includes 15 schools of instruction, has about 100 teachers, and over 2,000 students. Other musical colleges and conservatories are also in successful operation.

B. is justly celebrated for its schools. In 1892 the city owned 177 school buildings and leased 29 more. During the year 11 new grammar and primary buildings were completed; 4 more begun; land purchased for 3 others; 7 kindergartens added to the 36 old ones; appropriation made for a mechanic arts high-school building to cost \$160,000; and of \$125,000 for a parental school for boys and of \$25,000 for one for girls. In the school year 1892-3 there were 63,347 day scholars; 5,623 evening scholars; \$1,485,411 paid teachers, officers, and school committee; and \$2,560,591 for total expenditures. The system of public secondary instruction consists of the English High School, the Public Latin School, the Girls' High School, the Girls' Normal School, the Girls' Latin School, the Evening High School, and the high school of the annexed districts. The Public Latin School in Boston, the oldest school in the United States, was founded 1635. Its main object has always been the preparing of boys for entrance to college, especially to Harvard. A great number of eminent men have been among its graduates—Cotton Mather, Hancock, Samuel Adams, Everett, Bowdoin, Robert C. Winthrop, Hillard, Sumner, Emerson, Motley, William H. Channing, Henry Ward Beecher, William M. Evarts, Phillips Brooks. The English High School was established 1821, to meet the wants of those not intending to obtain a collegiate education. Since 1881 these two have been housed in a magnificent new building, perhaps the largest free public-school building in the world, erected at a cost of \$750,000. This edifice occupies a parallelogram 423 ft. long, by 220 ft. wide, with two interior courts. It is of brick, in the Renaissance style, with sandstone trimmings, and much external ornamentation of terra-cotta. It contains 78 rooms and halls, including a drill-hall, a gymnasium, two libraries, lecture halls, assembly-halls, rooms for drawing, laboratories, and 48 school-rooms. The vestibules are adorned with marble statuary. The Girls' High School also occupies an extensive building, containing 66 rooms and halls; and many of the grammar schools occupy buildings remarkable for excellence of design and completeness of appointments. The Latin School for Girls was established 1878, to furnish a training for girls similar to that given to boys at

BOSTON.

the Public Latin School. Girls pass from it, on graduation, to the colleges for women. At first it was regarded as an experiment; its success is now assured. The Normal School for Girls was established 1852, for the training of female teachers. Roxbury, Dorchester, Charlestown, Brighton, West Roxbury, and Jamaica Plain (a part of the West Roxbury district) have each its high school. The city also supports a school for deaf-mutes, evening industrial schools, and a manual training-school. The excellence of the public-school system long retarded any considerable development of private schools in Boston. Of late years a greater number have sprung up. Conspicuous among these are the kindergartens, 31 of which have been established and are supported as free kindergartens mostly for the children of the poor, by Mrs. Quincy Shaw, daughter of Prof. Agassiz. The whole number of private schools in the city is about 100; the number of pupils attending such schools (1885) was 7,250. Prominent among private schools of secondary grade or preparatory to college are, in B. proper, the Chauncy Hall School, and, in the Roxbury district, the Roxbury Latin School, a free endowed school, founded 1645, and second in antiquity to the Latin school in B. only among the schools of the country.

Of higher educational institutions the city contains two, B. University and B. College. The former, an institution for both sexes, was incorporated 1869, and is under the auspices of the Meth. Epis. Church. Its endowment fund is of more than \$1,000,000. It consists of a school of theology, a college of music, a school of law, a college of liberal arts, corresponding to an undergraduate department, a school of medicine, and a school of all the sciences, or graduate department. The attendance of students in these departments has risen to several hundreds. With these departments is affiliated, as an agricultural department; the Mass. Agricultural College at Amherst. The university now occupies handsome buildings, completed 1882. The Boston College is a Rom. Cath. institution, founded 1860, by the fathers of the Society of Jesus. Harvard College, at Cambridge, the chief educational institution of Massachusetts, has been so intimately connected with the life of B. as almost to make fitting a description of it in this article. Its medical department, the Harvard Medical School, is actually located in B., in a fine new building, admirable in arrangements and appointments. This building was completed 1883, a century from the foundation of the school. The school has at present about 300 students, and is of exceptionally high grade. One of the most important educational institutions of the state, at B., is the Mass. Institute of Technology, one of the earliest technical schools in the United States. It was opened 1865, and has since had rapid and secure development. It now consists of a School of Industrial Science giving both theoretical and practical instruction in such sciences, together with training in the associated professions; a School of Mechanic Arts; and the Lowell School of Practical Design. This last is provided by the trustees of the Lowell Institute, founded 1839 by

BOSTON.

the will of John Lowell, Jr. The Lowell Institute also provides courses of lectures and instruction for advanced students and for general audiences in the city. A great number of lectures are annually given in B.; for these and other purposes there are 150 halls, of which the largest is Mechanics' Hall, in the permanent exhibition building of the Mass. Charitable Mechanic Assoc. This hall has a seating capacity of 8,000.

B. is exceptionally well provided with libraries, nearly all freely accessible. The Public Library, established 1854, is now the largest library in the United States, with the exception of the library of congress. It had 1892 a central library, 9 branches, 16 delivery stations and reading-rooms, 576,237 volumes, \$200,360 in trust funds, and \$167,133 in annual expenditure. A new building was completed in 1895; cost \$2,368,000. The Boston Athenæum, a society incorporated 1807, has a library of about 600,000 vols. and 50,000 pamphlets, supported by a fund of over \$500,000. Other important libraries are those of the State and of the Massachusetts Historical Soc., and the Congregational Library. The library of Harvard University, numbering about 300,000 titles, also is accessible. Though not holding the literary pre-eminence which it had a generation ago, B. is still an important centre of publication, especially for books of superior literary grade. The long celebrated *Atlantic Monthly*, the *Andover Review*, and many other periodicals, are published here. B. has (1896) 9 daily newspapers, besides weekly, monthly, and quarterly publications, numbering in all 228. The first newspaper of the new world, the *Boston News-Letter*, was started here 1704. Many of the distinguished writers of America reside in or near B.

The city government of B. consists, since 1885, of a mayor, board of aldermen, and common council, annually elected. The mayor controls the executive powers, and has a veto on legislative acts; subject to confirmation by the board of aldermen, he appoints all heads of departments, boards, and commissions, except that the board of police is appointed by the governor, and the street commissioners are elected by the people. There are 12 aldermen, chosen by districts, and paid; the common council has 72 members, chosen in the 24 wards, and unpaid. The departments are arranged in five groups. The police commissioners have charge of the issuance of liquor licenses. The police force consisted 1892 of 953 officers and men, and cost for maintenance \$1,161,624. The fire dept. had 762 officers and men and 40 engines, and cost \$1,000,000. The public system of water-works in B. dates from 1848, when a supply was introduced from Lake Cochituate, a lake of 800 acres, 20 m. distant. Since then, the flow of Sudbury river has been added, more than doubling the supply, which is received into the Chestnut Hill Reservoir, of 125 acres, with a capacity of 732,000,000 gallons. Charlestown has a separate water supply. Gas and electric light are supplied by private companies. The new system of sewerage is the most formidable piece of engineering construction ever undertaken in the city; it includes

BOSTON.

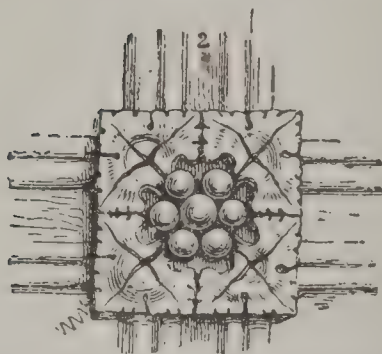
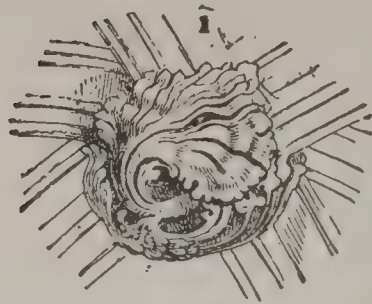
about 490 m. of sewers, great pumping works, and a reservoir capacity of 7,850,000,000.

In 1900 there were reported in B. proper 727 manufacturing industries and 7,247 establishments, which employed \$143,311,376 capital and 72,142 hands, paid \$39,184,191 for wages, \$99,557,019 for materials, and \$23,652,792 for miscellaneous expenses, and had products valued at \$206,081,767. The principal industries according to capital employed were: wholesale manufacture of men's clothing \$14,884,507; printing and publishing \$19,081,495, foundry and machine-shop products, \$9,371,928; liquors, \$7,518,668; boots and shoes, \$8,930,528; brick and stone \$4,976,230; confectionery, \$4,455,184.

The city auditor reported 1893, Jan. 31, city debt proper, \$36,081,374.06; co. debt \$3,576,000; Cohituate water debt \$16,758,773.98; Charlestown debt \$51,000; Mystic water debt \$441,000—total funded debt \$56,908,148.04; sinking funds and other means of redemption \$25,999,268.80; net debt \$30,908,879.24. The city then had a right by law to borrow \$3,910,618 for municipal expenses 1893-4. The receipts from all sources 1892-3 were \$32,184,015.74; expenditures \$29,965,097.07; balance 1893, Jan. 31, \$2,218,918.67. The assessed valuation 1902, was, real, \$957,496,900; personal, \$233,777,716; total, \$1,191,274,616; tax rate, \$14.80. In 1902, May, B. had 34 national banks, which had \$33,850,000 capital; \$21,701,037 surplus; \$178,973,545 deposits; \$165,895,018 in loans. There were, 1893, 15 savings banks; 9 loan and trust cos.; 2 state and 45 private banks. There were 18 fire-insurance cos., which had total income \$4,961,482; losses 1892, \$2,606,172; losses paid \$2,484,256. The commerce of B. in the calendar year 1902 was, imports \$78,148,457; exports \$86,655,666.

B. was founded by English colonists, led by Winthrop, 1630, and named from Boston in England. During the colonial period it was famous as the headquarters of New England Puritanism, and as a centre of resistance to royal authority. Many of the exciting events preceding the Revolution took place here, such as the Boston Massacre 1770, and the Tea Party 1773. The measures of the British government were directed especially against it. In 1775 it was occupied by Gen. Howe, and invested by Gen. Washington, who compelled its evacuation 1776. A city government was conferred 1822. B. was the centre of transcendentalism and of the anti-slavery movement. In its early politics it adhered to the Federalist and Whig parties, but is at present Democratic. In 1872 a great fire burned over 65 acres of valuable business property; the number of buildings burned was 776, total loss \$75,000,000.

East B. is an island n.e. of B., important for its wharves and docks. South B. is a peninsula s.e. of B., and the seat of some of its most important manufacturing industries. Charlestown, a peninsula opposite B. on the n., contains Bunker Hill and a United States navy-yard. Brighton, w. of B. on the mainland, contains an extensive abattoir. Roxbury, West Roxbury, and Dorchester, to s.w. and s., are very attractive suburbs, occupied mainly with residences;



Bosses.—1, From Wells Cathedral, Lady Chapel. 2, From St. Mary's Church, Bury St. Edmunds.



St Botolph's Church, Boston, England.

the parts of them more remote from B. abound in charming rural scenery, and are adorned by many villas and much tasteful landscape gardening. Of suburban cities not annexed, adjoining B., the chief are Cambridge, Somerville, Chelsea, Newton, and Malden, with populations of from 60,000 to 17,000 respectively; most of these are inhabited chiefly by persons doing business in B.

The population of Boston was, by the United States census (1890) 448,477; (1900) 560,892, of which about one-third was of foreign birth.

See *Bacon's Dictionary of Boston*; tenth census, vol. xviii.; the *City Auditor's Reports*; the *Memorial History of Boston*, 4 vols., ed. J. Winsor; N. B. Shurtleff, *Topographical and Historical Description of Boston*; S. G. Drake, *Old Landmarks of Boston*.

BOSTON: ancient English borough and seaport in Lincolnshire, on both sides of the Witham, 28 m. s. e. of Lincoln. It is supposed identical with the Icanhoe, where St. Botolph founded an abbey, 654, destroyed 870 by the Danes. Under the Normans, B. became a place of importance, and in 1204 it paid the largest dues (£780) of any English port except London (£836). In the reign of Edward III., many foreign traders settled, and the merchants of the Hanseatic League established a guild in B. After their departure, the town declined, and the suppression of the monasteries by Henry VIII. further injured it; but his grant of a charter of incorporation, and Mary's subsequent grant of extensive lands, partly compensated for this. The modern town consists chiefly of two good streets, one on each side of the river. The parish church of St. Botolph (1309), 245 by 98 ft. is one of the largest without cross aisles in England, and has a fine tower 300 ft. high, surmounted by a lantern visible 40 m. at sea. The church was partially restored 1857 at the expense of the inhabitants of Boston, Mass., which was named from the English city. The clearing of the river of silt and the closing of the adjacent fens have greatly promoted the trade of B. Vessels of 300 tons can reach the heart of the town. The chief export is corn. Pop. of muni. bor. (1871) 14,526; of parl. borough, 18,279; (1891) 14,593 and 18,478. Since the passing of the Distribution of Seats Act, 1885, B. returns only one member to parliament. B. is a great market for cattle and sheep, and manufactures canvas, iron, brass, ropes, leather, bricks, whiting, and hats. In 1880, 471 vessels, of 35,651 tons, entered, and 476, of 34,968 tons, cleared the port.

BOSTON: a game at cards, played by four persons; named after the city of Boston, some features of the game being said to have reference to its siege. B. has been called the North American *whist*. There are three varieties. Fifty-two cards are used. Five cards to each player are dealt twice round, then three cards to each. A second pack is cut for the trump. The counters are kept in fine baskets, one for each player, and one placed upon the centre of the table. If the first player judges that he can take five tricks, he announces, 'I go Boston.' The others may overbid, saying, 'I go 6,' '7,' '8,' etc. Any failure to take the announced number of tricks involves a forfeit.

BOSTON—BOSTON UNIVERSITY.

BOS'TON, THOMAS: 1676, Mar. 7—1732, May 20; b. Dunse, Berwickshire, Scotland; of poor parents. As early as his 12th year he was concerned about the state of his soul, and while only a boy at the grammar-school, he formed a society of three for religious conference and prayer. After a hard struggle, he succeeded in entering Edinburgh Univ. 1691. He received license as a preacher, 1697, and was greatly appreciated by the serious portion of the community; though his uncompromising character prevented him from receiving a clerical charge for two years. He was then ordained minister of Simprin, and 1707 was translated to Ettrick, where he died. Of his voluminous works the best known is the *Fourfold State*, 1720, discoursing of man's paradisiacal integrity, his ruin by the fall, his begun regeneration on earth, and consummate bliss or woe hereafter. An excellent little treatise of B.'s is entitled *The Crook in the Lot*. As a pastor, B. was eminently laborious, and deservedly popular. In the ecclesiastical courts he distinguished himself by his zeal in defense of the church's independence, and in the controversy regarding the *Marrow of Modern Divinity* (which was objected to as being too free in its offers of salvation), he was one of the ten ministers who declared their approval of that work: see **MARROW CONTROVERSY**. As a theologian B. is perhaps the most 'Representative Man' in the whole list of Scottish divines. His peculiar modes of expressing the Calvinistic psychology have colored the style of Scottish preaching more than any other writer has done. Although often showing what is now called narrowness, B. shows also flashes of insight and beauty, quaint felicities of diction and an occasional shrewdness of thought, even yet worth studying. B.'s autobiography has been a great favorite with the Scottish peasantry.

BOSTON PUBLIC LATIN SCHOOL: oldest educational institution in the United States, founded 1635. John Cotton, minister of the First Church, bequeathed to it half of his estate. It has always been a free school, supported by private gifts and public funds from the town of Boston. Its first master was Philemon Pormont. Notable are the long terms served by headmasters Ezekiel Cheever (q.v.) (master 1670-1708), John Lovell (1730-76), and Francis Gardner (1831-76): Moses Merrill was headmaster 1901, appointed 1877. Pupils (1901) 577; instructors 21. The school is of very high grade, and prepares boys for college. Many distinguished names are on the long roll of its pupils.

BOSTON UNIVERSITY: institution of learning in Boston, Mass., chartered 1869. Its nucleus was the Boston Theol. Seminary of the Meth. Episc. Chh., founded 1839, which was adopted as one of the 'schools' of B. U. 1871: the property of the seminary, amounting to abt. \$250,000, was conveyed to the corporation of the university. The other 'schools' were founded successively as follows: School of Law 1872, School of Medicine 1873, and School of All Sciences 1874: these 'schools' are intended to follow a collegiate training. Those departments of the university

which do not imply a previous collegiate education are denominated 'colleges.' The first of the 'colleges' opened was the College of Music, 1872: the New England Conservatory of Music (in Boston) adopted the work of this college and constituted it its graduate dept. 1891. The Coll. of Liberal arts, organized 1873, has the usual 4 classes—freshman, sophomore, junior, senior; besides graduate, special, and unclassified students; students in this college (1893) 317; professors and instructors 26. The Mass. Agri. Coll. at Amherst serves as the B. U.'s College of Agriculture: its students, graduate and undergraduate, were (1893) 155; professors and instructors 13.—The schools had (1893) students and faculties as follows: theology, fellow 1, graduate students 5, undergraduates 131; professors and instructors 15; law students 219, professors and instructors 14, lecturers 23; medicine, students 154, professors and instructors 42. The aim of the School of All Sciences is to afford to bachelors of arts of whatever college the means of post-graduate instruction; and secondly to meet the wants of graduates in theol., law, med. or other professional courses, who may wish to broaden and supplement their professional culture by study of related sciences, arts and professions. The scheme comprises thorough instruction in all cultivated languages and their literatures; all natural and mathematical sciences; all theological, legal, and medical studies; all fine arts; all branches of special historical study. As this school crowns and unifies the whole work of the University, its faculty consists of all regular professors of the different faculties, together with such additional instructors as the work of the school may require. Women are represented on the staff of professors and instructors as well as in the studentship. B. U. is the first university in the world organized throughout without regard to sex. The total assets 1892, Aug. 31, amounted to \$1,599,000.70; total liabilities to \$80,204.23: net assets \$1,518,796.47. Scholarships to the amount of \$10,600 were granted to over 100 students 1892. In 1902 the university reported 144 professors and instructors, 1,396 students, 5 009 graduates, 3 fellowships, 203 scholarships, 25,000 volumes in the libraries, \$1,005,538 in productive funds, \$840,000 invested in grounds and buildings, \$152,963 in total income, and \$40,346 in benefactions. The president of the B. U. (ever since its foundation) is William F. Warren, S.T.D., LL.D.

BOS'TRA: see BOZRAH.

BOSWELL, bōz'wēl, JAMES, of Auchinleck, in Ayrshire: friend and biographer of Dr. Samuel Johnson: 1740, Oct. 29—1795, June 19; b. Edinburg. He studied at Glasgow, and for one year at the Univ. of Utrecht—in the same year (1763) in London making the acquaintance of Johnson, whom he had greatly admired and desired to know. Afterward he made a tour of Europe, visited Corsica, bearing a letter of introduction to Paoli, the Corsican leader, from J. J. Rousseau, and became enthusiastic for Corsican independence. He pub. 1768 *Account of Corsica* (3d ed. 1769), containing memoirs of Gen. Paoli, of whom he was a lifelong friend and admirer.

BOSWELLIA.

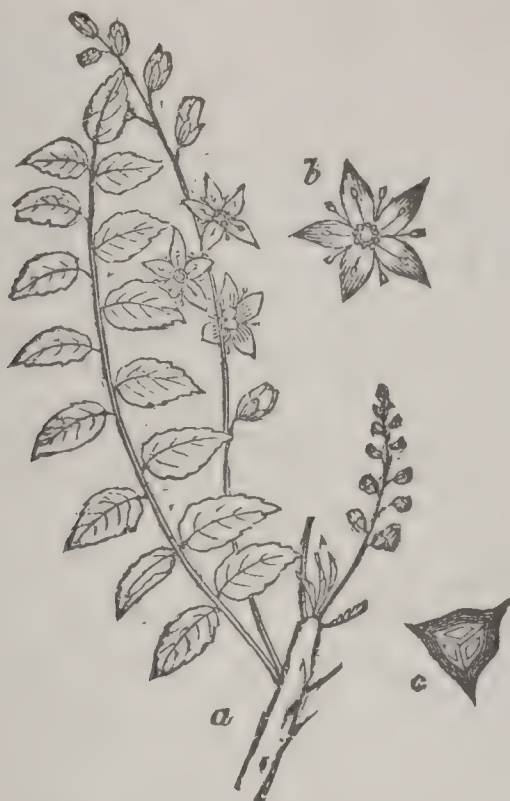
B. became a member of the Faculty of Advocates, 1766, but never applied himself with earnestness to the law. In 1773 he was admitted into the Literary Club instituted by Johnson, of which Burke, Goldsmith, Reynolds, and Garrick were members. From this time he made it his principal business to note down the sayings and doings of Johnson, with whom he associated on intimate terms, and whom he accompanied on his tour in Scotland and the Hebrides, 1773. B. was married 1769 to a lady named Montgomery, and had several children. Led by his taste for London society, he removed thither in mature life, and entered at the English bar, but without attaining success in the profession. After Johnson's death, 1784, he employed himself in arranging the materials which he had collected, and preparing his long-contemplated biography. His *Journal of a Tour to the Hebrides* appeared 1785, his *Life of Samuel Johnson*, 2 vols., 1791. Both have gone through many editions. Boswell has been emphatically styled by Macaulay 'the first of biographers.' His work is indeed full of details, but they are such as exhibit character, and are arranged in the most interesting manner. He conceals neither his own faults, nor those of Johnson, but presents a picture of which the truthfulness is too evident to be questioned; and Johnson is probably better known by the pages of B. than by his own writings. B. died in London. Beside the works already mentioned, he was author of one or two minor productions of temporary interest. In 1856, Dec., there was published a posthumous volume of *Letters of James Boswell, addressed to the Rev. W. J. Temple, from the Original MSS.*, in which the gay, *insouciant* character of the man very strongly appears.

His eldest son, SIR ALEXANDER BOSWELL, Baronet, of Auchinleck, 1775-1822, Mar. 26, was the author of a number of Scottish songs, full of humor, which he collected into a volume, entitled *Songs, chiefly in the Scottish Dialect* (Edin. 1803), some of which had considerable popularity. He wrote also *Edinburgh, or the Ancient Royalty*, a picture of Scottish manners in the dialogue form, and edited many of the older productions of Scottish literature. A duel with Mr. Stuart of Dunearn, occasioned by personal allusions in a publication connected with a parliamentary election, resulted in his death.

BOSWELLIA, *bōz-wēl'ī-a*: genus of trees of the nat. ord. *Amyridaceæ* (q.v.), having flowers with a small five-toothed calyx, five petals, and a crenulated glandular disk; a triangular capsule with three valves, three cells, and one seed in each cell; the seeds winged on one side; their cotyledons intricately folded, and cut into many segments. Two or three species only are known, of which the most interesting is *B. serrata* (or *B. thurifera*), the tree which yields OLIBANUM (q.v.), now very generally believed to have been the FRANKINCENSE (q.v.) of the ancients. It is a large timber-tree, with pinnate leaves, which have about ten pair of hairy serrated oblong leaflets, and an odd one, each leaflet about 1-1½ inch in length. The flowers are small and numerous,

BOSWELLISM—BOSWORTH.

in axillary racemes, and of a pale pink color. When the bark is wounded, the delightfully fragrant olibanum flows out, and hardens by exposure to the atmosphere. The tree



Boswellia serrata:

a, part of a branchlet, with leaf and raceme of flowers; *b*, a single flower; *c*, a capsule, cross section.

is found in the mountainous parts of Coromandel, and is supposed to be a native also of other parts of India, and of Persia, Arabia, and perhaps Abyssinia. *B. glabra*, a very similar species, a native of India, also yields a resin, comparatively coarse, sometimes used for incense, and boiled with oil as a substitute for pitch.

BOSWELLISM, *n.* *bōz wēl-izm*: the style of James Boswell. **BOSWELLIAN**, relating to or resembling Boswell.

BOSWORTH, or **MARKET BOSWORTH**, *bōz wēth*: market-town in Leicestershire, Eng., on an eminence in a very fertile district, 12 m. w. of Leicester. Many of the people are employed in knitting worsted stockings. On a moor in the vicinity was fought, 1485, the battle in which Richard III. was slain, and which terminated the Wars of the Roses. On an elevation, called Crownhill, Lord Stanley placed the crown on the head of the Earl of Richmond, Henry VII. Here Simpson the mathematician was born; Dr. Johnson was an usher in the Free Grammar School, in which Salt, the Abyssinian traveller, and Richard Dawes, the Greek critic, were educated.

BOSWORTH, JOSEPH, D. D. 1789–1876, May 27; b. Derbyshire, Eng. philologist. He graduated first at Aberdeen, afterward at Leyden; he also took the degrees of B.D. and D.D. at Cambridge and Oxford. He obtained a curacy in the English Church 1815, and two years afterward the vicarage

BÖSZÖRMENY—BOTALLACK MINE.

of Horwood Parva, Buckinghamshire. He now devoted such time as an active discharge of his parochial duties left at his disposal to literature, and especially to researches in Anglo-Saxon and its cognate dialects. The result of his labors appeared 1823 in a work entitled *Elements of Anglo-Saxon Grammar*. Fifteen years afterward he published the work by which his name is best known, *A Dictionary of the Anglo-Saxon Language* (Lond. 1838; new ed. by T. Northcote Toller 1882). This was at the time a very valuable work; an abridged edition was afterward issued by the author. B. resided in Holland 1829-40, as British chaplain. He returned to England and was presented to the vicarage of Waithe, Lincolnshire. In 1858 he became rector of Water Stratford in Buckinghamshire, and also prof. of Anglo-Saxon at the Univ. of Oxford. In 1865, he published the Gospels in Gothic of A. D., 360 and the Anglo-Saxon of A. D. 995 in parallel columns with Wycliffe's version of 1389, and Tyndale's of 1526. He was author of various other philological works.

BÖSZÖRMENY, *bé-sér-māñ*: chief of the six towns of the free district of Hajduk, in the east of Hungary, about 10 m. n.n.w. of Debreczin. It has active trade in rye, tobacco, water-melons, soda and saltpetre. Pop. (1892) 21,238.

BOTAL, *bo-tál'*, or BOTALLI, *bo-tál'lē*, LEONARDO: b. Asti, Italy, about 1520: distinguished physician and author of medical works. To him has been ascribed the discovery of the opening between the auricles of the heart, still called the 'foramen of Botal,' but it had been spoken of by Vesalius and by Galen. The opening is closed at or near birth, and B's description was wrongly based on an exceptional case occurring in a grown person.

BOTALLACKITE, *bōt-āl'ak-īt* [from the *Botallack Mine* (q.v.), where it occurs]: a variety of Atacamite occurring in thin crusts of minute interlacing crystals closely investing killas.

BOTALLACK MINE, *bē-tāl'āk*: locality on the w. coast of Cornwall, England, near Penzance, noted for a tin and copper mine which extends far under the sea. The coast scenery is remarkable, and attracts many tourists.

BOTANIC GARDEN.

BOTANIC GARDEN: grounds in which plants are collected and cultivated in order to scientific study. The various economical applications of botany, however, in agriculture, manufactures, medicine, etc., are almost always particularly in view; and one great object of a B. G. is to bring to a country useful foreign plants, to determine the question of their suitableness to its climate, and to introduce those which may be cultivated with advantage. B. gardens are now deemed indispensable to the proper equipment of universities; they are reckoned among the public institutions of great cities, and even of nations, and are established in new colonies, not only for the sake of science, but as one of the means of promoting their prosperity. The first approach to a B. G. appears to have been made about 1309, in the garden of Matthaeus Sylvaticus, at Salerno; botanical science, however, being subservient to medicine. Of a similar character was the medical garden established at Venice, by the republic, 1333. The example of Venice was followed by other Italian cities, and plants from different parts of the world began to be collected. At length, about contemporaneously with the revival of botanical science in modern times, the first true B. G. was formed 1533 at Padua, by Musa Brassavola, for Gaspar de Gabrieli, a wealthy Tuscan noble; soon followed by those of Pisa, Florence, Bologna, and Rome. The first public B. G. was that of Pisa. A public B. G. was established at Padua 1545, by a decree of the republic of Venice, at the request of the professors and students of medicine. The republic of Venice greatly encouraged the study of botany by sending persons to the Levant, to Egypt, and even to India, to procure plants for this garden.—The B. G. of Leyden was begun 1577; it had in its infancy the care of Clusius, and was brought to great perfection by Boerhaave, who was prof. of botany there.—The first public B. G. in Germany was established by the Elector of Saxony at Leipsic 1580, and was soon followed by others.—France had no B. G. till Louis XIII. established the *Jardin des Plantes* at Paris, begun 1610, completed 1634.—There was no public B. G. in England till 1632, when that of Oxford was founded by the Earl of Danby. Private botanic gardens, however, had existed in England for the greater part of a century.—The B. G. of Edinburgh, the first in Scotland, was founded about 1680, as a private B. G., by Dr., afterward Sir Andrew Balfour, a zealous naturalist, who had inherited a collection of plants formed by a pupil of his own, Patrick Murray, of Livingston, at his country seat, and transferred them to Edinburgh; and the city of Edinburgh afterward allotted to it a piece of ground, and allowed an annual sum for its support out of the revenues of the university.

The B. G. at Kew occupies a high place among British national institutions; it presents one of the richest collections of plants in the world, and has been greatly improved under the care of Sir William Jackson Hooker and his son, who succeeded him 1865. The *Hortus Kewensis* of Mr. Aiton, to whom the garden owed much of its pros-

BOTANOMANCY.

perity in the 18th c., illustrates the greatness which it had even then attained. One of its chief glories is now its immense palm-house, finished 1848, which is 362 ft. in length, and the central part 100 ft. wide, and 66 ft. high.—A palm-house has, in like manner, greatly added to the attractions and value of the B. G. of Edinburgh. It is 100 ft. long by 60 ft. wide, and 70½ ft. high. These houses permit something of the stateliness and magnificence of the palms of the tropics to be seen in Britain.

Of botanic gardens on the continent of Europe, the *Jardin des Plantes* may be regarded as holding the first place, both with reference to the strictly scientific study of botany, and to the care bestowed upon the introduction and diffusion of useful or beautiful plants from all parts of the world. There is in France what may be called a system of botanic gardens—one at least in every dept.—to which plants are sent from the *Jardin des Plantes*, and from which, as they continue to be multiplied by propagation, they soon find their way into the hands of nurserymen and private cultivators. The B. G. connected with the imperial palace at Schönbrunn, in Austria, and that of Berlin, are the greatest in Germany. The former, begun 1753 by the emperor Francis I., was supplied with West Indian plants at enormous expense, the celebrated Jacquin being sent to procure them. The B. G. of New York, among the numerous botanic gardens of America; and that connected with the dept. of agriculture at Washington, are extensive and well-equipped; also the B. G. of Harvard Univ. founded 1805, completed 1871, where the distinguished Prof. Asa Gray has been in charge. The B. G. of Calcutta deserves to be mentioned as an important connecting-link between the botanic gardens of Europe and the botany of India. It has had the care of a succession of eminent botanists, and has been very useful both in transmitting Indian plants to other parts of the world, and in introducing valuable productions of other countries into India. At Buitenzorg, in the island of Java, are botanic gardens said to be the finest in the world.

In the laying out and arranging of botanic gardens, different methods are adopted, mere convenience and beauty being in some cases primarily regarded, and in other cases sacrificed to the supposed interest of science in an attempted scientific arrangement. A perfect adherence to a botanical system is, for obvious reasons, impossible; but a scientific arrangement of the plants in natural groups, so far as it can be conveniently accomplished, greatly increases the usefulness of a B. G., and facilitates the study of botany. Sometimes houses are devoted to particular orders of plants, as palms, heaths, or orchids; sometimes to plants of particular habit, as aquatic plants; and sometimes portions of the garden are advantageously devoted to the exhibition, at one view, of plants valuable for particular uses, as cereals or corn-plants, plants yielding fibre, etc.

BO'TANOMANCY: divination by means of plants
see DIVINATION.

BOTANY.

BOTANY, n. *bōt'ă-nŭ* [Gr. *botănē*, herbage—from *boskein*, to feed, to graze: F. *botanique*]: that branch of natural history which treats of plants, their structure, functions, properties, and habits, by which they are distinguished from one another. **BOTANIC**, a. *bō-tăn'ik*, also **BOTAN'ICAL**, a. *-ĭ-kāl*, relating to plants in general. **BOTAN'ICALLY**, ad. *-lŭ*. **BOTANIST**, n. *bōt'ă-nĭst*, one skilled in the nature and structure of plants. **BOT'ANIZE**, v. *-nĭz*, to seek for plants for the purpose of study. **BOTANI'ZING**, imp. a. **BOT'ANIZED**, pp. *-nĭzd*.

BOT'ANY: the science which treats of the Vegetable Kingdom (see **PLANT**). Everything that relates to plants is included in this science; there are, therefore, several great branches of it, in many respects very different from each other. Of these branches of the science, some, relating to plants in general, rather than to particular kinds or species, are sometimes included under the designation of *General B.* (sometimes called *Phytonomy*; Gr. *phyton*, a plant, and *nomos*, a law); while those which relate to particular species, their distinctive characters, distribution, etc., are comprehended under *Special Botany*.—In the former of these departments, the first place must be assigned to *Structural B.*, also called *Organology* or *Organography*, which has for its subject the structure of plants, the textures of which they are composed, and their various organs. Subordinate to this are the study of the elementary tissues of plants, sometimes called *Vegetable Histology* (see **HISTOLOGY**), and that of the anatomy of plants, sometimes called *Phytotomy* (Gr. *phyton*, a plant, and *tomē*, a cutting); both of which have recently been prosecuted with great assiduity. In both, the microscope is an indispensable instrument, and by means of it all the important discoveries of modern times have been made. Intimately connected with these is *Morphology* (Gr. *morphos*, a form, and *logos*, a discourse), that branch of botanical science which relates to what has been called the *Metamorphosis of Organs*, or, in other words, the gradual transmutation of leaves by the processes of vegetable life into the various organs with which a plant is provided, and their consequent assumption of new forms and adaptation to new uses. This branch of B., entirely of recent origin, has been described as being in the vegetable what comparative anatomy is in the animal kingdom, and has now become the exposition of an admitted great general law, almost equally important in reference to structural B. and to vegetable physiology. *Vegetable Physiology* or *Physiological B.* treats of the various kinds of organic activity in the life of plants. It is based upon *Structural B.*, an intimate acquaintance with which is indispensable to the study of it. The arguments or illustrations of natural theology, derived from B., are taken chiefly from structural B. and vegetable physiology considered together, the wisdom of the Creator appearing in his works equally in their structure and in the adaptation of all their organs to their respective wonderful functions. In connection with vegetable physiology, another branch of science claims attention—**VEGE-**

TABLE CHEMISTRY; of which there are two parts—an examination of the products of the living processes in plants, which, with all its well-known difficulty, is nevertheless comparatively easy; and an inquiry into these processes themselves, with respect to the chemical changes effected in them—an investigation of the secrets of that chemistry of nature which so far excels all that has yet been accomplished in laboratories. This is, however, a branch of chemistry rather than of B.; but it so far belongs to the latter, that although only subsidiary, it is indispensable. Even mathematics and natural philosophy have been called to the assistance of the philosophical botanist in his attempts to explain the phenomena of his own science.

Special B. has been rendered subservient to the study of general B., and errors in the former are also guarded against by dependence, to a certain extent, on the well-ascertained principles of the latter. A comprehensive view of the vegetable kingdom is indeed impossible without an inquiry into the number and peculiarities of the different species which it contains; but the attempt to classify and arrange these can be successful only when founded upon a knowledge of general laws relating to all vegetable organisms. That the discoveries of a botanist may be made known, the description of species is necessary; and works devoted to this are sometimes called works of *Descriptive B.* or of *Phytography* (*phyton*, a plant, and *graphē*, a writing). But in the description of plants, a multitude of terms must be employed, which almost exclusively belong to botanical science itself, while even those common to it with other departments of natural history, must be employed in senses modified by the peculiarities of the vegetable kingdom. Many of the terms used are such as belong to structural B. and vegetable physiology; but many also—for example, adjectives which designate the particular forms of leaves, etc.—become familiar only when an acquaintance with them is sought in order to descriptive B., and a knowledge of the different species of plants. Great precision is necessary in the use of these terms, and from the want of it, the descriptions of the ancients and of travellers unacquainted with B. often leave it impossible to determine the particular species intended. This gives rise to what is sometimes called in botanical works *Terminology*—an explanation of botanical terms, which, however, has no right to be regarded as a separate branch of science, or worthy of a distinct name; and the name which it has received is barbarous. When structural B. was little heeded, and little more was commonly supposed necessary for a botanist than a knowledge of species and the ability to distinguish them, ‘terminology’ was often separately taught, and the student was required to commit long tables of terms and their meanings to memory—a difficulty placed in his way at the outset which was both formidable and repulsive, like that which the student of the Chinese language must expect to encounter in its alphabet.

The necessity of classification and systematic arrange

BOTANY.

ment in B. will be very obvious, if the multitude of different kinds of plants is considered, fully 120,000 species being already known and described, while great regions of the earth are still unexplored. The systematic arrangement of plants is sometimes called *Systematic B.*, sometimes *Taxological B.* (Gr. *taxis*, order, and *logos*, a discourse), sometimes, less properly, *Taxology* or *Taxonomy*. The history and progress of the science have been marked by the different systems proposed, and prevalent at different times. These have been of two very distinct kinds, founded upon very different principles, and particularly adapted to very different objects, and are respectively designated *artificial* and *natural* or *physiological* systems. Artificial systems are based upon some single class of characters, in the external parts of plants, without reference to the importance of these characters in what concerns the life of a plant, or to the purpose for which it exists, and are adapted chiefly to the convenience of the student desirous of readily distinguishing species among the multitudes with which he has to deal. A work of descriptive B., arranged according to an artificial system, has been aptly likened to a dictionary in which the words are alphabetically arranged.

An artificial system cannot, however, serve the highest purposes of the science. But in framing a natural system, great difficulties are encountered, and imperfection of the system is necessarily involved in imperfection of the science. Based not upon one mere set of characters arbitrarily selected, but upon a consideration as far as possible of all characters which plants present, and not merely upon external forms viewed in themselves, but upon these and internal organization considered in their physiological relations, a natural system aims at exhibiting the real affinities which subsist in the vegetable kingdom; and evidently must be at all times liable to modification, and capable of improvement, as botanical science advances, either through the discovery of new plants or through phytotomical and physiological research: it also evidently requires the greatest scientific attainments and the highest powers of a philosophic mind. Nor is it one of the least of the practical difficulties that the affinities of plants are not such as to constitute a simple lineal series, but that they may be viewed as a multitude of groups arranged around centres, and connected with each other upon different sides and by a great variety of ties.

Yet the rudiments of a natural system have always been sought after, and in some measure attained, when B. has been studied as a science—whenever it has become anything more than a mere acquaintance with a few plants and their names. The *genera* into which species are grouped by all botanists are natural, and are the basis upon which all classification proceeds in its further generalizations. So sensible was Linnæus of the importance of maintaining this character of the genera, that when a rigid adherence to his artificial system would have caused the division of a genus into parts, and the consequent separation of species very nearly allied, he kept the genus unbroken, and maintained the usefulness

BOTANY.

of his artificial system, to the student desirous of finding the names of plants, by referring from one of its classes or orders to another for species exceptional among those of their genus as to the number of their stamens or pistils, or their *diœcious*, *monœcious*, or *hermaphrodite* flowers.—The classification of species, however, in genera and larger natural groups, is connected as much with other branches of natural history as with B.; see NATURAL HISTORY: SPECIES: GENUS: VARIETY. For a discussion of some of the debated questions common to botany and zoology, see DARWINIAN THEORY.

An important branch of botanical science is that called *Geographical B.*, or the *Geography of Plants*, and sometimes *Phytogeography*. It must be regarded as yet in its infancy, though a multitude of observations have been recorded in works of descriptive B., and by botanical travellers. It is the object of *Geographical B.* to connect with the occurrence or prevalence of plants in particular countries a great variety of facts as to climate, altitude, geology, etc., and even facts of history. It aims at the establishment of great general laws, which, however, it has not yet been able to establish: see GEOGRAPHICAL DISTRIBUTION.

Another branch of botanical science which has recently sprung up, and has acquired magnitude and importance, is PALEONTOLOGICAL B., or FOSSIL BOTANY. The petrified fruits and wood, the beautiful impressions of ferns and palms, and other traces and remains of former vegetation, which appear in vast numbers and great variety in different strata of the earth's crust, present a most interesting field of scientific research. The study of the different kinds of fossil plants and the comparison of them with existing species, belong strictly to the science of B.; the study of their relations to particular strata or formations, and so to particular periods in the physical history of the globe, belongs to geology. The study of fossil plants has proved exceedingly useful in guiding to just and philosophic views of the mutual relations even of species and groups still existing: see PALEONTOLOGY.

The subject of the DISEASES OF PLANTS falls within the province of B. It has scarcely yet been treated or studied as a distinct branch of science, though it has not been overlooked in its relation to Vegetable Physiology, with which its intimate connection is obvious, and it has received no little attention in its practical bearings on agriculture and other arts.

ECONOMIC B. includes all that relates to plants, considered with reference to these arts and to practical uses. That part of it which relates to medicinal plants has been often separately and elaborately treated under the name of MEDICAL BOTANY. For notices of the more important plants affording food to man, and therefore cultivated in fields or gardens, in warm or in cold climates, and of those valuable for their timber, their fibre, or the dye-stuffs or medicines which they yield, see the various botanical titles.

For so much of the first principles of the science of B. as may fill up a part of the above outline, see PLANT: VEGETABLE CHEMISTRY: VEGETABLE PHYSIOLOGY.

BOTANY.

Having thus endeavored to sketch an outline of the science of B., we must refer to the articles PLANT, VEGETABLE PHYSIOLOGY, instead of attempting here to fill up a part of that outline by exhibiting the first principles of the science. It remains for us, in the present article, to give a very brief account of the history of B., and outlines of the systems of classification most deserving of attention.

History of B. and Outlines of Principal Systems of Classification.—It is recorded (1 Kings, iv. 33) that Solomon ‘spoke of trees, from the cedar in Lebanon even to the hyssop that springeth out of the wall.’ There is reason also to believe that Zoroaster gave some attention to plants, and that this study early engaged some of the philosophers of Greece. The oldest botanical work which has come down to us is that of Theophrastus (q.v.), pupil of Aristotle, B.C. 4th c. His descriptions of plants are very unsatisfactory, but his knowledge of their organs and of vegetable physiology is wonderful, when we consider the low state of this branch of science through many centuries after his time. It was not, indeed, till after the revival of letters in western Europe, that it was again studied as it had been by him. About 400 years after Theophrastus, in the first c. of the Christian era, Dioscorides of Anazarbus, Asia Minor—a herbalist, however, rather than a botanist—described more than 600 plants in a work, which continued in great repute through the middle ages, a proof of the destitution of that period of any botanical science of its own. About the same time the elder Pliny gave attention to B., and his writings contain some account of more than 1,000 species, but compiled from various sources, without much discrimination, and mingled with many errors. Centuries elapsed without producing another name worthy of mention in a history of botany. It was among the Arabians that the science next began to be cultivated, about the close of the 8th c. The greatest name of this period is Avicenna. Centuries again elapsed, a longer interval than before, during which it made no progress whatever. It was not till the beginning of the 16th c. that B. resumed its place as a science. The first to revive it was Otto Brunfels, a German, who published 1530 his *Historia Plantarum Argentorati*, or History of the Plants of Strasburg, 2 vols., folio, illustrated with cuts. He was speedily followed by Bock or Tragus, Fuchs or Fuchsius, and other Germans; by Matthioli and Cæsalpinus in Italy; Dodœns or Dodonæus in the Low Countries; De L’Obel, or Lobelius, Dutch physician at the court of England; Gesner in Switzerland; Dalechampa and Moulins, or Molinæus, in France, and by many others, for B. now began to be prosecuted wherever learning flourished, and with great zeal and success. Chairs of B. were founded in universities, botanic gardens (q.v.) were established in many places, and travellers began to explore even remote parts of the world. One of the greatest names of the latter part of the 16th c. is that of L’Ecluse, or Clusius, who travelled through many countries, encountering great perils and hardships in pursuit of his favorite science, and was finally prof. of B. at Leyden. The name

BOTANY.

of Dr. Turner, 'the father of English B.,' belongs more to the 17th c. than to the 16th. The number of species known and described had increased, in the beginning of the 17th c., to more than 5,000, but the study of them was much impeded by confusion of synonyms and by want of classification, while classification was rendered extremely difficult by imperfect knowledge of the structure and organs of plants. The foundations of a natural system of classification may be said to have been laid in the latter half of the 17th c., by Dr. Robert Morison, native of Aberdeen and prof. of B. at Oxford, followed toward the close of the c. by the celebrated Ray, one of the greatest naturalists that England has produced.

The application of the microscope in B. opened a new epoch of the science, about the middle of the 17th c. Henshaw and Hook, both Englishmen, were among the first to employ this instrument to good purpose in the examination of the organs and structure of plants; but the greatest eminence belongs to Grew, also an Englishman, physician at Coventry, and to Malpighi, an Italian, perhaps more celebrated for his anatomical than for his botanical discoveries. Vegetable physiology now began to be recognized as the highest department of botanical science.

In the latter half of the c. perhaps the most eminent name after Ray is that of Joseph Pitton de Tournefort, French gentleman, who devoted his whole life to the pursuit of botanical science, and who must be particularly noticed in a sketch of the history of B., on account of a system which he proposed, which was more generally received and employed than any other till the time of Linnæus. Another botanist of the same period, Rivinus, prof. at Leipsic, gave to the world a botanical system which was received to some extent in Germany. Tournefort's system was partly natural and partly artificial; that of Rivinus was perhaps the most perfectly artificial ever proposed.

The science of B. made rapid progress during the 17th and 18th c., both by the extension of botanical research in different parts of the world, and by the careful study of particular groups or families of plants. Its progress was promoted by the publication of many valuable descriptive works. Important discoveries were also made in vegetable physiology.

About the middle of the 18th c., the wonderful genius of Linnæus affected a great change in B., as well as in zoology. His name marks an epoch in the history of the science; not chiefly, however, in consequence of the new system which he introduced, nor even because of the discoveries which he made, but rather because he was able to make himself master of all that had been ascertained by his predecessors, and to exhibit it in lucid order. He gave also a great impulse to botanical studies, by the enthusiasm with which he inspired his pupils. And among the benefits which he conferred on B., in common with zoology, not the least considerable was the introduction of trivial

BOTANY.

or specific names to be used with the name of the genus as the designation of particular species.

From the time of Linnæus the process of B. during the remainder of the 18th c. became more rapid; and since the commencement of the 19th c. it has advanced with gigantic strides. A large space would be occupied by a mere enumeration of the names of those who have promoted it by their labors and discoveries. Some notion of what botanical literature has become may be formed from the fact that Pritzel, in his *Thesaurus Litteraturæ Botanicæ* (Leip. 1847-51), enumerates about 15,000 publications.

Von Haller, anatomist and philosopher, as well as botanist, was, of all the contemporaries of Linnæus, the only one who could be regarded as his rival. Of all the botanists of the latter half of the 18th c. the most deserving to be mentioned with the great Swede in the history of the science are Bernard de Jussieu, and his nephew, Antoine Laurent de Jussieu, who applied themselves with great earnestness to the study of the natural affinities of plants and the formation of a natural system, a work which Linnæus himself attempted, and of the importance of which he was so sensible, that while acknowledging the imperfect success of his endeavors, he declared his resolution to persevere in them to the end of his life. The Jussieus traced the outlines of a system which the greatest botanists since their time have not so much sought to change as to complete. Among those who have labored with greatest success in this work, must be mentioned De Candolle, Fries, Endlicher, Brongniart, Meisner, Von Martius, Lindley, and Brown. The botanist last named acquired by his work on the plants of New Holland, published 1810, great eminence, not on account of new plants which he described, but on account of the light which he threw upon the most difficult questions connected with the structure of plants and vegetable physiology. Many remarkable discoveries in vegetable physiology have recently been made by Link, Meyen, Schleiden, Von Mohl, Lindley, Sachs, and others.

The student may acquire a nearly complete knowledge of the Linnæan artificial system, without knowing much in reality of B.; but, even in beginning to learn the natural system, he must learn some of the first principles of the science. Jussieu followed Ray in dividing plants into three great primary divisions — *Acotyledones* (q.v.), *Monocotyledones* (q.v.), and *Dicotyledones* (q.v.); having respectively no cotyledon or seed-lobe, one cotyledon, and two cotyledons. And, however the names may be changed, or characters assumed from other parts of the plant, these great divisions of the vegetable kingdom still subsist; the *Acotyledonous* plants being also, according to characters taken from the stem, *Acrogenous* (q.v.); the *Monocotyledonous* plants, *Endogenous* (q.v.); and the *Dicotyledonous* plants, *Erogenous* (q.v.). Endlicher is the only botanist of great note who has attempted to make primary divisions of the vegetable kingdom essentially different from those indicated by Ray, and

His attempt has not commended itself to general approval. De Candolle gave expression to an important truth in botanical science, when he united the two divisions of monocotyledonous and dicotyledonous plants under the common title of *Vascular plants*, in opposition to acotyledonous or *Cellular plants*; the vascular plants being the *phanerogamous*, and the cellular the *cryptogamous*. Lindley has endeavored to modify the natural system by dividing the *asexual* or *flowerless* (cryptogamous) plants into the two classes of *Thallogens*—with the stem and leaves undistinguishable—and *Acrogens*, with the stem and leaves distinguishable, thus limiting the term acrogens to those which have a distinct stem; and in like manner dividing the *sexual* or *flowering* (phanerogamous) plants into five classes, viz., *Rhizogens*, with fructification springing from a thallus; *Endogens*, and *Dictyogens*, with fructification springing from a stem, the wood of which is youngest in the centre, and the seed with a single cotyledon—the former having parallel veined permanent leaves, and the wood of the stem always confused; the latter having net-veined deciduous leaves, and the wood of the stem when perennial arranged in a circle around a central pith; *Gymnogens* and *Exogens*, having the wood of the stem youngest at the circumference, and always concentric, the seed with two or more cotyledons; the former having the seeds quite naked, the latter having them inclosed in seed-vessels. But others generally prefer the simpler division of phanerogamous or vascular plants into monocotyledonous or endogenous, and dicotyledonous or exogenous, the former including Lindley's endogens and dictyogens, the latter his exogens, gymnogens, and rhizogens; although the latter have only a provisional place assigned them, in the absence of well ascertained views of their structure.

One of the great advantages of the natural system is, that the plants which it brings together are very generally found to agree in their properties, as well as in their structural characters. There are, indeed, species which, in respect of their properties, are anomalous or exceptional in the genera or orders to which they belong; but these exceptions do not invalidate the general rule, according to which we expect the most deadly poisons in the order *Loganiaceæ*, bland mucilage and useful fibre in *Malvaceæ*, wholesome succulent herbage with a certain amount of acridity or pungency in *Cruciferae*, etc., etc. The knowledge of the properties of genera and orders is of great use in guiding inquiry, and it is thus that modern science attains in rapid succession to discoveries practically important.

In the determination of the intermediate sub-divisions of the natural system, botanists have not yet been so successful as with regard to these primary divisions, and the ascertainment of the characters and limits of lowest subdivisions—orders, tribes, and genera. Great difficulty has been found in arranging the orders of natural groups, although the attempt has been assiduously made by some of the greatest botanists. Endlicher recognized 7,205 genera or plants in all: and Hooker and Bentham's *Genera Plantarum* 7,565

The study of B. has come to be something vastly different from the collecting of flowers, counting stamens and pistils, naming by means of an artificial key, or getting some one to name, and preserving in a herbarium, useful as all this may be in a primary or grammar school. Flowering plants are but one of from 3 to 7 sub-kingdoms or branches of the vegetable kingdom (as variously constituted by different authors), the lower being the A B C to a proper knowledge of the higher, and to be studied whenever competent teachers and instruments can be secured. The lower require the microscope for any real examination; and even the elements of flowering plants, their tissues and special organs, cannot be verily known except by the student's microscopic work.

The new edition of Sachs's Text-Book of Botany, Book II., entitled *Outlines of Classification and Special Morphology of Plants*, by Dr. K. Goebel, translated by H. E. F. Garnsey, and revised by Dr. I. B. Balfour (Oxford 1887), may be taken as a standard. It divides plants into 4 great groups or sub-kingdoms: Thallophytes; Bryophytes or Mosses (including liverworts); Vascular Cryptogams (to which the author rightly prefers the name Pteridophytes, since some have no true tissue 'vessels'); and Seed-Plants (Spermatophytes or Phanerogams). This he regards only as a convenience, for no tabular classification can represent the complex relationships of nature. I. THALLOPHYTES: the vegetative body usually consisting of a thallus—that is, without differentiation into root, leaf, and stem; some, as many sea-weeds and the *Characeæ*, have these features, but have no endogenous roots and no root-cap. The main divisions are: 1. *Myxomycetes*: slime molds, naked shapeless protoplasm; 2. *Diatomaceæ*: the minute, mostly boat-like forms, abundant at bottom of pools; 3. *Schizophyta*: *a*, green slimes, including many of the minute green filaments in water, such as *Nostoc* and *Oscillaria*; and *b*, bacteria, with² no green color; all multiplying by self-division; 4. *Algæ*: sub-divided into green, brown, and red, though not on account of color, and including a great number of families of extremely different forms, from the single microscopic green cell, that has its habitat inside of a lichen, to the most gigantic sea-weed, but all having essentially the same mode of sexual reproduction; 5. *Fungi*: parasites and saprophytes, without chlorophyl; the spore, except in some of the lowest forms, developing into branching filiform tubes (*hyphæ*); some having only asexual forms; from these, ascending through smuts, molds, rusts, mildews, lichens, etc., to what are commonly called fungi, in which, however, the sexual reproduction seems to have been lost. II. BRYOPHYTES, the Liverworts (*Hepaticæ*) and Mosses: characterized by an alternation of generations, the sexual and asexual, and also of growths; the spore developing into a *protonema* [Gr. first hair] of a confervoid appearance, and from this a thallus (sometimes with stem and leaves), with the male and female

organs (antheridium and archegonia), from which last is developed the growth that produces spores. III. **PTERIDOPHYTES**, or Vascular Cryptogams, include ferns, rushes, and club-mosses; here is a similar alternation of generations, but the thallus comes to an end when the second generation begins, and hence is called *prothallium*; here first appear true roots, and a differentiation of the plant body into systems of tissues, such as woody bundles, sieve-tubes, etc.; the sporangia are borne on ordinary or metamorphosed leaves; and the entire plant, in this stage, is but a sporophyte. IV. **SPERMATOPHYTES**, or Seed-Plants (Phanerogams): of the two classes, Gymnosperms (including Conifers, Cycads, and the aberrant Gnetaceæ) and Angiosperms (ordinary flowering plants), the former connect flowering plants with Pteridophytes, inasmuch as they have the structure of angiosperms, while the organs of sexual reproduction approach those of the 'heterosporous' ferns, rushes, and lycopods. As these have microspores that develop into antheridia, and also macrospores (some of them evolving internally a prothallium, as seeds do an embryo plantlet) which develop only a female organ, so the pollen grains of the gymnosperms show certain characters of microspores, and the embryo-sac and embryo show certain homologies with macrospores. Moreover, the leaf-unrolling of Cycads, the leaves of the Ginko, and the appearance of conifers, have visible resemblance either to ferns or to club-mosses. Dr. Goebel remarks that our present knowledge would be best represented by putting all, except thallophytes and angiosperms, into one grand division, Archegoniataë. The class Angiosperms is divided as usual into monocotyledons and dicotyledons, the embryo-sac being here also regarded as a macrospore; but no prothallium is formed in it before fertilization, as in the Gymnosperms; the nucleus of the embryo-sac, after that, is divided until its multiplied cells fill the sac, forming the endosperm, which corresponds to the thallium; the pollen grains are the microspores, and develop as in Gymnosperms. The **DICOTYLEDONS** have two series: I. The *Choripetalæ* [Gr. a company of petals, same as polypetalous], the so-called orders or families, and sub-orders, in the text of Dr. Goebel's edition, being arranged as families, with a confusion of terminal syllables, under what may be termed super-orders: 1. *Julifloræ*, embracing the orders Amentaceæ, Piperineæ, and Urticineæ; 2. *Centrospermæ* or *Caryophyllineæ*; 3. *Aphanocyclæ*, orders Polycarpicæ, Hydropeltidineæ, Rhœadinæ, Cistifloræ, and Columniferaë; 4. *Eucyclæ*, orders Gruinales, Terebinthineæ, Æsculineæ, Frangulineæ; 5. *Tricoccæ*; 6. *Calycifloræ*, orders Umbellifloræ, Saxifragineæ, Opuntieæ, Passiflorineæ, Myrtifloræ, Thymelineæ, Rosifloræ, and Leguminosæ. II. *Gamopetalæ* (monopetalous), to which the author prefers the name *Sympetalæ*, because there is no reason to believe that they originated in coherence of petals once separate; this series has two divisions: *Iso-*

BOTANY—BOTARGO.

carpæ, orders Bicornes, Primulinæ, Diospyrineæ; and *Anisocarpæ*, orders Tubifloræ, Labiatifloræ, Contortæ, Campanulinæ, and Aggregatæ. Certain plants of unknown or doubtful affinity, chiefly parasitic (Podostemaceæ and Ceratophyllaceæ, water-plants), are left unclassified, except as families. This condensed view will indicate that much progress has been made in the science of B., especially in the great divisions once massed and ignorantly dismissed as 'cryptogams;' also in the discovery of affinities running all through the vegetable kingdom, and of the essential likenesses under very different forms. While all persons would do well to know observable native plants by name, the scene of botanical study is the laboratory, with the microscope and such apparatus, coloring-fluids, chemical reagents, and systematic exercises, as are given in recent manuals, e.g., Prof. Bower's (Univ. of Glasgow) *Practical Botany*, Parts I. and II.

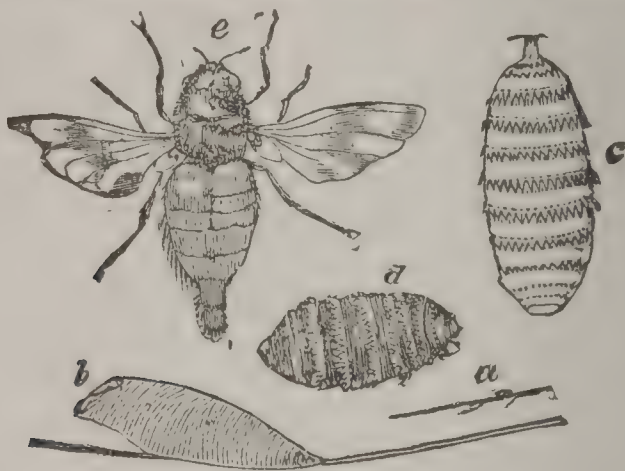
BOT'ANY, FOSSIL: see PALEONTOLOGY.

BOT'ANY BAY: a haven of New South Wales, lat. 34° s., long. 151° 15' e., discovered by Cook on his first voyage, 1770, and named by him from the great number of new plants in its vicinity—a characteristic, however, rather of Australia in general than of this particular locality. In 1787 it received England's first penal colony in the east; and though it was supplanted the very next year by Port Jackson, a vastly superior harbor immediately north of it, yet it long continued to be the popular designation, not merely of this convict settlement, but of the Australian convict settlements generally. On the shore of B. B. there was erected, 1825, a column to the memory of that eminent French navigator, the unfortunate La Perouse.

BOTARGO, *bō-tār'gō* [Sp.]: a relishing sort of food, being a sausage made of the roes of the mullet fish, and eaten with oil and vinegar. It is much used on the coast of the Mediterranean as an incentive to drink.

BOT--BOT-FLY.

BOT--BOT-FLY and **GAD-FLY**: names common to many insects of the family *Æstridæ* (q.v.), or *Æstracidæ*, the genus *Æstrus* of Linnæus. The name bot is sometimes restricted to the larvæ, which appears to have been its original use, the other names being given to the perfect insects; the name gad-fly often to insects of the genus *Tabanus* (q.v.), to which some try to restrict it. The insects of this family are now supposed not to be those which were called *Æstrus* by the ancients, although, like them, extremely troublesome to cattle. They are dipterous (two-winged) (q.v.) insects, nearly allied to the *Muscides* (House-fly, Flesh-fly, Blow-fly, etc.), with small 3-jointed antennæ, and mouth destitute of a proboscis.—The Horse-bot, or Gad-fly of the horse (*Gasterophilus*, or *Gastrus*, or *Æstrus Equi*), sometimes also called the *Breeze* and *Horse-bee*, is much less common in Britain than in some parts of the continent of Europe, and occurs chiefly in elevated heathy districts. It is not quite half an inch in length, woolly,



Horse Bot-fly:

a, a horse-hair with eggs of bot-fly; *b*, one egg magnified; *c*, larva; *d*, pupa; *e*, perfect insect, a little larger than life.

with yellowish gray head, rusty thorax, abdomen, and the wings whitish, with brownish-gray spots. The abdomen of the female terminates in a blackish horny tube. In the latter part of summer, the female hovers about horses, and deposits her eggs on their hairs, where they remain attached by a glutinous substance until they, or the larvæ just emerging from them, are licked off by the tongue of the horse, their destined place being its stomach. It is believed that the fly deposits her eggs only on those parts which are accessible to the horse's tongue, seeming to prefer the back of the knee-joint, where they may sometimes be found in hundreds. The larva is yellowish, without feet, short, thick, soft, composed of rings which have a double row of short teeth surrounding them; it is somewhat acuminate at one end—the head; and the mouth is furnished with two hooks, one on each side, for taking hold of the inner coat of the horse's stomach, to which the B. attaches itself, and from which it derives its subsistence, hanging in clusters sometimes of three or four, sometimes of more than one hundred. Here it spends the winter and in the following summer, when it is about an inch,

BOT-FLY.

long, it disengages itself, and being carried through the horse's intestines, burrows in the ground; and changes into an oval black pupa with spiny rings, from which, in a few weeks, the perfect insect comes forth. Multitudes, of course, become the prey of birds, before they can accomplish their burrowing.—It has been disputed whether or not bots are very injurious to horses; and some have even maintained that, when not excessively numerous, their presence is rather beneficial, an opinion certainly without apparent probability, while it is universally admitted, that in great numbers they are hurtful.—The Red-tailed Horse-bot (*G.* or *Æ. hæmorrhoidalis*), also a British species, deposits its eggs upon the lips of the horse, distressing it very much by the annoyance which it gives in



Ox Bot-fly:

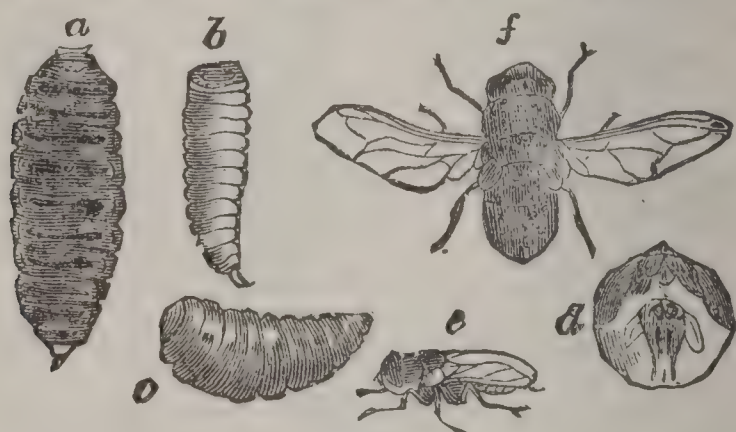
a, larva, full grown, natural size; *b*, pupa; *c*, perfect insect, a little larger than life.

so doing. The larvæ attach themselves chiefly to the surface of the intestine, about the anus of the horse, and sometimes cause an annoying irritation. Linseed-oil is used for their removal. The Ox-BOT, or Ox Gad-fly of N. Amer. has lately been proved to be other than the *Æstrus*, now *Hypoderma bovis*, of Europe, and is named *H. lineata*. A full account is given in *Insect Life*, U. S. dept. of agri., 1892, June; and, contrary to the old notion, it is shown that the eggs, deposited mostly on the flanks and heels of cattle and attached to hairs, are licked off into the mouth, and the larva begins a nine or ten months' travel through the animal's body, until in the late winter it reaches some point beneath the skin of the back, its further development going on in the ulcer there formed, whence it drops itself out and pupates in the ground. It is called Heel-fly in Texas; cattle there protect themselves by standing in the water from 9 A.M. to 5 P.M., according to one observer. Kerosene smeared on their heels has been successfully used. Persons tending cattle sometimes become infested; and the egged-hairs may be taken in milk. The eggs are living larvæ when taken into the mouth, and at once attach themselves to the soft membranes with which they come in contact. The European B. in the fly state is larger, and, among other differences, has yellow hairs covering the front half of the thorax. The white maggot, called *warble* or *wormal*, 'feeds



Ovipositor of Bot-fly, highly magnified.

on the juices beneath the skin, causes a swelling called a *warble*, forming a sort of sac, within which it lives and grows, amid a kind of purulent matter suited to its appetite, and from which it finally emerges, leaving a small sore, and, like the horse-bot, undergoes its further transformations in the ground. By pressure on the warbles, bots may be destroyed, and when they are numerous, assiduous oiling of the back of the ox is resorted to for the same purpose.—The SHEEP-BOT (*Cephalomyia* or *Estrus Ovis*) is a much more serious pest than any other British species, and is not unfrequently very destructive to flocks. The insect is smaller than either the ox-bot or horse-bot; it is of grayish color, with a large head and yellow face, and is most abundant in damp situations and woody districts. It is seen chiefly in the months of June and July. Sheep exhibit great alarm when it approaches them, and seem to seek, by keeping their noses close to the ground, and by



Sheep Bot-fly:

a, larva, full grown; *b*, larva, younger; *c*, pupa; *d*, the face of the perfect insect, magnified; *e*, perfect insect, natural size; *f*, perfect insect, magnified.

incessant motion of their feet, to keep it from entering their nostrils. It is in the nostrils of the sheep that this fly deposits its eggs, and the larvæ, when hatched, make their way into the maxillary and frontal sinuses, feeding upon the juices there, until they are ready to change into the pupa state, in April or May of the following year, when they find their way again through the nostrils to the ground. They seem to cause great irritation in their progress up the nostrils of the sheep, and the poor animals run hither and thither, snorting and in great excitement.

'The common saying, that a whimsical person is *maggoty*, or has got *maggots in his head*, perhaps arose from the freaks of the sheep when infested by their bots.' The bots cause considerable irritation in the cavities, where they usually fix themselves, and sometimes get into the brain, and cause death.—These larvæ move with considerable quickness, holding on by the hooks with which their mouth is furnished, and contracting and elongating the body. It is said that flocks fed where broom is in flower are never infested with them; and when many cases arise in a flock, it is found particularly advantageous to remove it to a dry soil.—Goats, deer, and other quadrupeds also

BOTCH—BOTHER.

are liable to be assailed by different kinds of gad-fly. The eggs of one of the species which attacks the fallow-deer, are deposited in the nostrils, and the larvæ make their way in large numbers to a cavity near the pharynx. Reindeer are excessively tormented by these insects, one kind depositing its eggs in their nostrils, and another in their skin; and it is no infrequent thing for a large part of a flock to be destroyed by them. When feeding where bot-flies are numerous, they keep such watch against them, that they neglect to eat, become emaciated, and often actually perish in consequence.—Even human beings have sometimes been afflicted by insects of this family. Humboldt saw Indians in S. America having the abdomen covered with tumors produced by their larvæ.

BOTCH, n. *böch* [It. *bozza*, a swelling: Dut. *botse*, a lump or boil; *butse*, a contusion—from *botsen*, to strike: Gael. *boc*, a blow, a pimple]: a red swelling on the skin, particularly the face; a blotch; a pimple. **BOTCHY**, a. *böch'î*, marked with botches: see **BOTCH** 2.

BOTCH, v. *böch* [Swiss, *batch*, a lump of something soft, a patch—from *batschen*, to put on a patch: Ger. *büssen*, to mend: It. *bozza*, an imperfect piece of work: Gael. *boidsear*, a stupid fellow]: to work without knowledge; to mend or patch clumsily: N. an imperfect and bungled piece of work. **BOTCH'ING**, imp.: N. the repairing, mending, or making clumsily. **BOTCHED**, pp. *böcht*: ADJ. done imperfectly and clumsily. **BOTCH'ER**, n. one who; a mender of old clothes. **BOTCHERY**, n. *böch'ér-î*, clumsy addition; only patchwork. *Note.*—The two preceding entries are intimately connected in their etymologies and meanings.

BOTH, a. conj. *bëth* [AS. *butu* or *batuca*: Icel. *badir*: Sks. *ubha*: Ger. *beide*]: the one and the other; the two; as well.

BOTH, *bôt*, JOHN and ANDREW: celebrated painters, who, being united in their works like Beaumont and Fletcher, are, like them, usually spoken of together: b. Utrecht, where their father was a painter on glass—John in 1610; the date of Andrew's birth is not known. After studying under Abraham Bloemart, the brothers went to Italy, where they soon won high reputation. John painted landscapes, adopting Claude for his model, while Andrew filled in the figures after the style of Bamboccio, and in so careful a manner that the pictures looked like the work of one hand. John's landscapes are characterized by delicious warmth of sky, softness of distance, and general truthfulness to nature; even the different hours of the day may be distinguished in some of his best pictures, so careful are his tints. The works of the brothers are still in great repute, and bring high prices whenever offered for sale. One of the brothers was accidentally drowned in a canal in Venice, 1650; the other then settled in Utrecht, where he died six years afterward.

BOTHER, n. *böth'ér* [Gael. *both*, perturbation: Ir. *buaid-hirt*, trouble, affliction: Dut. *bulderen*; Ger. *poltern*, to

BOTHIE—BOTHRIOCEPHALUS.

make a noise, to rage: Dan. *bulder*, noise, tumult (see POTHER)]: confusion with noise; fuss; bustle; confusion; perplexity: V. to confuse with noise; to annoy; to tease; to perplex. BOTH'ERING, imp. BOTH'ERED, pp. -*erd*. BOTH'ERA'TION, n. -*ā'shūn*.

BOTHIE: see BOTHY.

BOTHNIA, *bōth'nī-a*: name formerly given to a country of n. Europe, along the e. and w. shores of the Gulf of Bothnia (q.v.), the e. portion now being comprised in Finland (q.v.), and the w. forming the Swedish governments of Pitea and Umea.

BOTHNIA, GULF OF: part of the Baltic Sea, north of the Isle of Aland, having on its e. shore Finland, on the w. Sweden and Lapland, with Tornea for its n. limit. It extends from lat. 60° to 66° n., and long. 17° to 25° 35' e., its greatest length being about 400 m., and its average breadth 100 m. Its depth varies from 20 to 50 fathoms, but both along its shores and in the middle are many small islands, sand-banks, rocks, and cliffs, called *skaers*, which render the navigation difficult; though on the whole it is less dangerous than other parts of the Baltic, and has many good harbors. The rivers which fall into this gulf, both from Sweden and Finland, are numerous; and the waters of the gulf itself are but slightly salt. In winter, it is usually so hard frozen that it can be crossed by sledges.

BOTHIRENCHYMA, n. *bōth-rēng'kēm-ă* [Gr. *bothros*, a ditch or furrow; *engchuma*, anything poured in, an infusion]: in *bot.*, dotted or pitted vessels with depressions inside their walls.

BOTHRIOCEPHALUS, *bōth-rī-o-sēf'al-ūs* [Gr. *bothrion*, a little pit, and *cephale*, a head]: genus of intestinal worms, belonging to the order of *Cestoid Worms* (q.v.) and included, until recently, in the genus *Tania* (tape-worm, q.v.). The head in this genus is not furnished with four sucking disks, as in the true tape-worms, but with two lateral longitudinal hollows, which seem to serve only for adhesion by means of a partial vacuum; and to have nothing to do with nutrition. Nourishment is indeed supposed to be obtained entirely by the imbibing of fluids through the entire length of the worm; and while this process of imbibing takes place, there is also an exudation—as *exosmose* accompanies *endosmose* (q.v.) in the roots of plants—of peculiar oleaginous drops, which may probably be in part the cause of the injurious effects produced by these worms upon the health of the animals infested by them. The species of B. are very abundant in predaceous fishes, and occur more sparingly in fish-eating birds; the immature and sexless young being found in fishes and inferior aquatic animals, either in peculiar cysts, or in the intestinal canal. Sticklebacks are often seen distended to an unusual size by a species of B. which lies free in the cavity of the abdomen; but in the stickleback its joints and sexual organs always remain undeveloped; it is only when the stickleback has been digested in a bird's stomach, that the B. released, and finding

BOTHRODENDRON—BOTHWELL.



A few Segments
of *Bothriocephalus latus*.

itself at last in suitable circumstances, acquires its mature form, becoming an inhabitant of the bird's intestines. Only one species of *B.* occurs in man, *B. latus*, which is at once distinguished from the common tape-worm by the different form of its segments, but has been often confounded with another species of tape-worm, under the name of Broad Tape-worm. The segments are much broader than they are long and each contains organs of reproduction. The worm is strictly androgynous. It is scarcely known in Britain, but is of frequent occurrence in some parts of Europe, and sometimes attains a length of 15 ft. or upward; and a coil of these worms is frequently expelled at once from a patient. The *B.* is much more easily expelled than the true tape-worms. The same means are employed. The geographical distribution of this worm, which is most frequent in low, marshy countries, has led to the conjecture that its youngest brood may inhabit some of the smallest aquatic animals, and that it may find its way into human beings by their eating salads, fruit which grows near the ground, or the like.

BOTHRODENDRON, *n. bōth' rō-dēn' drēm* [Gr. *bothros*, a pit or cavity; *dendron*, a tree]: in *geol.*, a genus of coal-measure stems with dotted surfaces, and with opposite rows of deep oval concavities; a decorticated condition of ulodendron.

BOTHWELL, *bōth' wēl*: small village in Bothwell parish, Lanarkshire Scot., on the right bank of the Clyde, 8 m. e.s.e. of Glasgow. The river is here crossed by the celebrated bridge, the place of the bloody encounter between the Covenanters and Monmouth 1679, when the former were defeated. Near the village are the magnificent Norman ruins of Bothwell Castle, at the foot of which the Clyde washes the fine scenery of 'Bothwell Bank,' celebrated in Scottish song. Pop. (1881) 1,520; (1891) 2,400.

BOTHWELL, JAMES HEPBURN, Earl of: abt. 1526-78. On his father's death, 1556, he succeeded as fourth earl to the great inheritance which made the Earl of B. the most powerful noble in the s. of Scotland. At first he opposed the Reformation party, but on their accession to power he easily changed his politics, and, 1561, formed one of the deputation of lords sent to convey the youthful Queen of Scotland to her kingdom. He was shortly after made a privy-councilor; but his violence and misconduct soon became intolerable, and he was ordered to quit Edinburgh. In 1562, March, he and the Earl of Arran were committed to the castle for conspiring to seize the queen's person. B. made his escape, was recaptured at Holy Island, again escaped, and sailed to France. He speedily returned, but finding Moray close on his trail, embarked for the continent. Not appearing at his trial, he was outlawed. In 1565, after the queen's marriage with Darnley, he reappeared, and, having strongly espoused her cause against

BOTHY—BO-TREE.

Moray and his party, was suddenly restored to favor and even high influence. In 1566, Oct., while performing a judicial tour in Liddesdale, he was attacked and wounded, and the queen manifested her interest in his danger by riding 20 miles and back to see him, a journey which brought on a dangerous fever. At Craigmillar, some time afterward, B. attempted, unsuccessfully, to overrule her objections to a divorce from Darnley. A more thoroughgoing method was open to him, and on the night of 1567, Feb. 9, the house in which Darnley lay sick at the Kirk of Field was blown up with gunpowder. The public voice loudly charged B. with the murder, but he was not formally indicted till Mar. 28. He came to the trial attended by 4,000 followers, and received an easy acquittal. Two days later he carried the sword of state before the queen at the opening of parliament, and at its close all his lands and offices were confirmed to him, in consideration of his 'gret and manifold gude service done and performit not only to her lienes' honor, weil, and estimatioun, but alsua to the comone weil of the realme and leiges thair of.' At a supper on the following night the leading nobles signed a bond approving of Bothwell's acquittal, and commending him as a fit husband to the queen, pledging themselves to stand by him. On Apr. 24, B., accompanied by a strong force, carried off the queen to Dunbar Castle; on May 6 he was divorced from his wife, and on the 15th his marriage with Mary was solemnized at Holyrood. He had previously been created Duke of Orkney. His guilty triumph was short; the wrath of the nation was roused, and at the end of one month Mary was a prisoner in Edinburgh, while B., sailing to Orkney, was captured as a pirate by a Danish war-ship and taken to Denmark. He died a prisoner in Draxholm Castle. See *Life* by Schiern, translated from the Danish by Berry (1880).

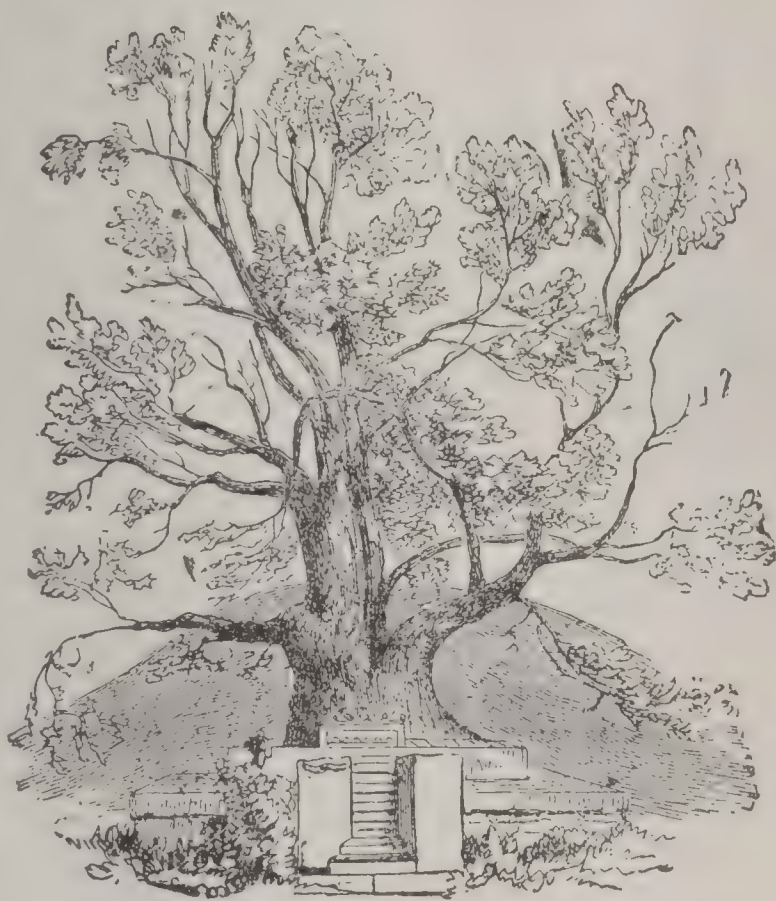
BOTHY, or BOTHIE, *bóth'í*, or BOOTHY, or BOOTHIE, *bóth'í* (see BOOTH): originally a humble cottage or hut, but for many years popularly signifying in Scotland a barely furnished, generally uncomfortable habitation for farm-servants, mostly in the e. and n.e. counties. It is usually under the same roof as the stable or at a short distance. The inhabitants are generally unmarried men, who frequently have their own food to prepare. Public moralists decry the B. vehemently. The bands of Irish and Highland women living together in the East Lothian cottages may be ranked as bothieites, and do not strengthen the argument for the B., which is only one of several foul blots on the agricultural system. The increase of farm cottages is reducing the number of bothies.

BOTONÉ, or BOTTONY, *bót'tun-í*: in *her.*, a cross of which the ends are in the form of buds or buttons.

BO TREE, *bō'trè*: the name given in Ceylon to the PIPUL-TREE or PEEPUL (q.v.) of India (*Ficus religiosa*, ord. *Moraceæ*). It is held sacred by the Buddhists, and planted close by every temple, attracting almost as much veneration

BOTRYCHIUM.

tion as the statue of Buddha itself.—The B. T. of the sacred city Anarajapoorā, is in all probability the oldest tree in the world of which the age can be ascertained by historical evidence. It was planted B.C. 288, and Sir James Emerson Tennent, in his work on Ceylon, published 1859, gives reasons for believing that the tree was then really of the wonderful age of 2,147 years, and refers to historic documents in which it is mentioned at different dates, as A.D. 182, 223, and so on to the present day. This tree is



Bo-tree.

From a drawing in Tennent's work on Ceylon.

invested in the estimation of the Buddhists, with wonderful sanctity. 'To it,' says Sir James, 'kings have even dedicated their dominions in testimony of their belief that it is a branch of the identical fig-tree under which Gotama Buddha reclined at Uruwelaya when he underwent his apotheosis.' Its leaves are carried away as treasures by pilgrims; but it is too sacred to be touched with a knife and therefore they are gathered only when they fall.

BOTRYCHIUM, *bōt-rīch'ī-ŭm*: genus of Ferns, of the division *Ophioglossæ*, having the *spore-cases* (or seed-vessels) distinct, sub-globose, clustered at the margin, and on one side of a pinnated *rachis* (an altered frond), 2-valved, without any trace of an elastic ring, and opening transversely. A n. N. Amer. species is *B. Lunaria*, MOONWORT, a

BOTRYOID—BOTRYTIS.

little plant, frequent in dry mountain pastures, but not



Moonwort Fern.
(*Botrychium Lunaria*.)

applied to any particular use. A species more worthy of notice is *B. Virginicum*, of which the geographical distribution is very remarkable. It abounds in America in many parts of the southern states, the mountains of Mexico, etc.; in Australia; in some parts of Asia, as the Himalaya Mountains; and is found also in Norway, though in no other part of Europe. It is large and succulent, and is boiled and eaten in the Himalaya, in New Zealand, etc. It is called RATTLE-SNAKE FERN in some parts of America. There are five other species and varieties in e. United States.

BOTRYOID, *bõt'ri-oyd*, or **BOTRYOIDAL**, a. *bõt'ri-oy'däl* [Gr. *botrus*, a bunch of grapes; *eidos*, shape]: resembling a cluster of grapes. **BOTRIOLITE**, n. *bõt'ri-õ-lit* [Gr. *lithos*, a stone]: a mineral composed chiefly of lime, silica, and boracic acid (Datolite).

BOTRYTIS, *bõ-tri'tis*: genus of Fungi (q.v.) now distributed; some are conidial forms of various Ascomycetes; many are known as Mold (q.v.) and Mildew (q.v.). The name was given from the resemblance of the stalked asexual spores (*conidia*) to grapes in clusters or rows; but all parts of these fungi are so minute as to need the microscope for examination. To the unaided eye the visible parts resemble frost or white powder. The most important in economical respects are the species that affect the silk-worm, the grape-vine, and the potato, the first assuming after death a floury appearance (see *MUSCARDINE*). The name *Botrytis infestans* was given to the species causing 'the potato rot' (q.v.) on discovering its nature subsequently to the great destruction of the crop in 1842 and 45. The name *Peronospora* has been substituted for *Botrytis* and the genus made the type of a family or order *Peronosporæ*—in some classifications included in a class *Cœloblastæ* (meaning hollow branch, that is, filaments without internal partitions), and belonging to the great division *Oösporeæ*. The Peronospores grow in the cells of higher plants, the thread-like mycelium penetrating everywhere; and often sending bulb-like processes, called *haustoria*, into adjacent cells to drink up the fluids of the host in which the fungus is parasitic. Some infest mostly the under surface of leaves; the potato fungus penetrates every part of the plant, including the tubers.—There are two modes of reproduction in this genus. The asexual is from spores—represented in the figures as terminal on branchlets—borne on mycelial threads (hyphæ) that emerge through the breathing-pores (Stomata.—q.v.) usually on the

BOTRYTIS.

under side of a leaf (see LEAVES). The spores fall, and, alighting on other leaves, send into the tissues a speedily growing filament which branches into a new mycelial network. In some cases however, a spore internally subdi-



Peronospora parasitica:

a, plant, with mycelium, magnified; *b*, extremity of branch, with fructification; *c*, fructification, more highly magnified.

vides itself into ciliated zoospores which have locomotion, and work their way in or over the ground, or more directly come in contact with a plant, when they rest and send in a growing filament. The other or sexual reproduction is within the intercellular spaces of the host-plant. Short



Peronospora infestans:

a, Young plants proceeding from stomata.

b, Section of potato-leaf, showing the mode in which the mycelium creeps among the loose tissue of the leaf.

lateral branches of two kinds are put forth from mycelial filaments; one swells into a spherical *oögonium*; another becomes a club-shaped *antheridium*, which, meeting the first, penetrates it with a fertilizing tube, through which protoplasm is discharged. The oösphere, inclosed in the oögo-

BOTTS—BOTTA.

nium, becomes invested with a thick cell-wall, and is able to endure a drought or a winter to renew the species. The order has but one other genus, *Cystopus*, the conidia of which are formed beneath the epidermis of the host. *Pero-nospora parasitica* and *Cystopus candidus* infest especially the Crucifer family of plants; *P. viticola* is the grape mildew; and there are many other species.

BOTS, or BOTTS, n. *bòts* [Gael. *boiteag*, a maggot; *bouds*, maggots in barley]: a disease of horses caused by small worms hatched in their intestines from the larvæ of the *bot-fly*. BOT, n. *bòt*, a belly-worm, especially in horses: see BOT--BOT-FLY and GAD-FLY.

BOTTA, *bot'à*, CARLO GIUSEPPE GUGLIELMO: 1766--1837, Aug. 10; b. S. Giorgio del Canavese, in Piedmont: Italian poet and historian. He studied medicine in Turin. In 1794, he became a physician to the French army, and in 1799, he, Carlo Aurelio de Bossi, and Carlo Giulio, were appointed the provisional government of Piedmont. They were known as *Il triumvirato de tre' Carli*. After the battle of Marengo, he became a member of the Piedmontese Consulta. In the *Corps Legislatif* he gave offense to Napoleon by designating his government as despotic. In 1830 he was allowed to return to his native town, and was pensioned by Charles Albert. He died in Paris. Of his works of earlier date are the following, in which his admirable historic style is gradually developed: *Description de l'île de Corfu* (2 vols., Par. 1799); *Souvenirs d'un Voyage en Dalmatie* (Tur. 1802); *Précis Historique de la Maison de Savoie* (Par. 1803); *Histoire de l'Amérique* (Par. 1809). His epic poem in twelve books, *Il Camillo o l'ero Conquistata* (Par. 1816), was favorably received. But his most important works are his *Storia d'Italia dal 1789 al 1814* (Par. 1824), which has gone through many editions, and for which he received the quinquennial prize of 1,000 Tuscan dollars, founded by the Grand Duke Ferdinand II., 1814, in the *Accademia della Crusca* at Florence; his *Histoire des Peuples d'Italie* (3 vols., Par. 1825), in which he denies to the Christian religion and to philosophy the credit of having civilized Europe, and ascribes it to the restoration of learning; and the *Storia d'Italia dal 1490 al 1814* (20 vols., Par. 1832), which consists of Guicciardini's work (1490-1534), Botta's continuation of it (1535-1789), and the above-mentioned *Storia d'Italia*.

BOTTA, PAUL EMILE: French archeologist and traveler: 1805-70; son of Carlo Giuseppe Guglielmo B. While young he undertook a voyage round the world, and remained long about the w. coasts of America. In 1830 he entered the service of Mehemet Ali as a physician, and was in the Egyptian expedition to Senaar. The French govt. appointed him consul in Alexandria, and he made a journey in Arabia, whose results he gave in *Relation d'un Voyage dans l'Yemen, etc.* (Par. 1844). Being appointed consular agent to Mosul, B. began, at the instigation of the German orientalist Julius Mohl, a series of discoveries which form an epoch in archæological science. In 1843, B.

BOTTA—BÖTTGER.

began his diggings in the heaps of ruins near the Tigris, for monuments of Assyrian antiquity, and his reports, with disquisitions on the cuneiform writing of the Assyrians, are in *Mémoires de l'Ecriture Cunéiforme Assyrienne* (Par. 1848). The French govt. appointed a commission of learned men to conduct the publication of a magnificent archæological work, published under B's special superintendence, with the title, *Monument de Ninive, découvert et décrit par Botta, mesuré et dessiné par Flandin* (Par. 1849-50). In 1848, he published the *Inscriptions découvertes à Khorsabad*. In 1846, B. was appointed consul at Jerusalem, and, 1857, at Tripoli. He returned to France, 1868, and died at Achères, near Poissy. Although in abundance of results B. was far exceeded by Layard (q.v.), yet he certainly laid the foundation of Assyrian archeology. See ASSYRIA.

BOTTA, *bôt'tâ*, ANNE CHARLOTTE (LYNCH): author: 1815, Nov. 11—1891, Mar. 23; b. Bennington, Vt. She was educated in Albany, N. Y., and wrote for magazines while quite young. After several years in Providence, R. I., she settled in New York, and married Prof. Vincenzo Botta (q.v.) 1855. She achieved reputation as a writer of poems in a finished style of literary art, including among the best examples, *Paul at Athens*, *Webster, Books, and Wasted Fountains*, while she was specially successful in composing sonnets. Her poems were first collected 1845, and a new edition 1884 finely illustrated. She published also a *Handbook of Universal Literature* (1860), which gained much reputation and became a text-book in educational institutions. Her residence in New York became a prominent social centre for persons eminent in literature and art.

BOTTA, VINCENZO, PH.D.; author: 1818, Nov. 11—1894, Oct. 5; b. Piedmont, Italy. After receiving his education in the Univ. of Turin, he was made a prof. in that institution. He came to the United States 1853, and was made prof. of the Italian language and literature in the Univ. of the City of New York. B. published *Dante as Philosopher, Patriot, and Poet* (1865); *A Historical Account of Modern Philosophy in Italy*; and other works.

BOTTEL, or BOTTLE, n. *bôt'tl* [F. *botel*, diminutive of *botte*, a bunch or bundle: Gael. *boiteal*]: a bundle of hay or grass.

BÖTTGER, or BÖTTCHER, *bôt't'gër*, or BÖTTIGER, *bôt'te-gër*, JOHANN FRIEDRICH: 1682-1719, Mar. 13; b. Reuss-Schleiz: improver of the porcelain manufacture. He was apprenticed to an apothecary in Berlin, but became an enthusiast in the search for the philosopher's stone, for which he involved himself in many difficulties. He found patrons at the court of Saxony, and received large sums, but as he did not succeed in making gold, he was required to reveal his secret in writing. The king, dissatisfied with this production, sought to avail himself of the skill which B. really possessed, with a view to the manufacture of porcelain. B. was compelled, accordingly, to enter upon these experiments, of which the celebrated Meissen Porcelain was the result: see POTTERY. To prevent the revelation of the

art he and his assistants were treated as prisoners; and when Saxony was invaded by Charles XII. of Sweden, 1706, they were removed from Dresden to Königstein.

BOTTICELLI, *bot-e-chěl'ē*, SANDRO (originally Alessandro Filipepi): 1447-1515; b. Florence: eminent painter of the Tuscan school. He was at first apprenticed to Botticelli, a goldsmith, whose name he assumed; but as he showed genius for painting, he was transferred to the school of Fra Lippo Lippi. In his youth and early manhood, B. felt the spell of classical mythology, and produced many works on classical subjects—the finest his *Birth of Venus*, now at the Uffizi, and his *Venus with the Graces*, now at the Florence Acad. Numerous devotional pictures from his hand exist also, most of them marked by much imaginative refinement. His coloring is rich and fanciful, the light often enriched by gold, and the minutest care is shown in all the details. His flowers, especially his roses, are painted with marvellous delicacy. In the countenances, whether of Madonnas and angels, or of Venuses and Graces, there is a fascinating expression of wistful melancholy. Perhaps B.'s greatest works are the three frescoes, representing the Life of Moses, the Destruction of Korah, Dathan, and Abiram, and the Temptation of Christ, in the Sistine Chapel at the Vatican. He was powerfully impressed by the teaching of Savonarola; and, according to Vasari, his latter years were given to the study of the mystical theology. He seems also to be in part the author of a series of engravings in a primitive style.

BÖTTIGER, *böt'e-gër*, KARL AUGUST: 1760, June 8—1835, Nov. 17; b. Reichenbach, Saxony: one of the most erudite and thoughtful archeologists of Germany. He studied at Leipsic. In 1791, chiefly through the influence of Herder, he was appointed director of the gymnasium, and consistorial councilor at Weimar. Here he enjoyed the stimulating society of Schiller, Herder, Wieland, Goethe, and others. His literary activity at this period was prodigious. He edited several journals, and wrote multitudes of reviews, biographical notices, etc., for the *Allgemeine Zeitung*. In 1804 B. was called to Dresden, where he began to deliver lectures on special branches of classical antiquities and art. The result of these was: *Discourses on Archæology* (Dresden, 1807); *On Museums and Collections of Antiques* (Leip. 1808); *The Aldobrandinian Marriage Festival* (a mythico-allegorical interpretation of a picture discovered by a member of the Florentine family of Aldobrandini, representing a Roman marriage (Dresden, 1810); *Thoughts on the Archæology of Painting* (Dresden, 1811); and the *Mythology of Art* (Dresden, 1811). In 1814 appeared his *Lectures on the Dresden Gallery of Antiques* (Dresden); in 1821-25, his *Amalthea, or Museum of Mythological Art* etc. (Leip.); and in 1826, his *Thoughts on Mythological Art* (Dresden and Leipsic). In 1832 B. was elected a member of the French Institute. His works, both in Latin and in German, have been collected and edited by Sillig.

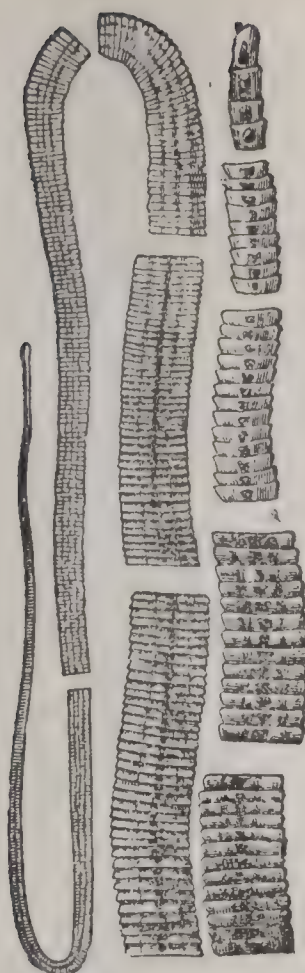
BOTTLE, n. *böt tl* [F. *bouteille*, a bottle, a bubble—from



Ancient Egyptian Bottles of Glass.



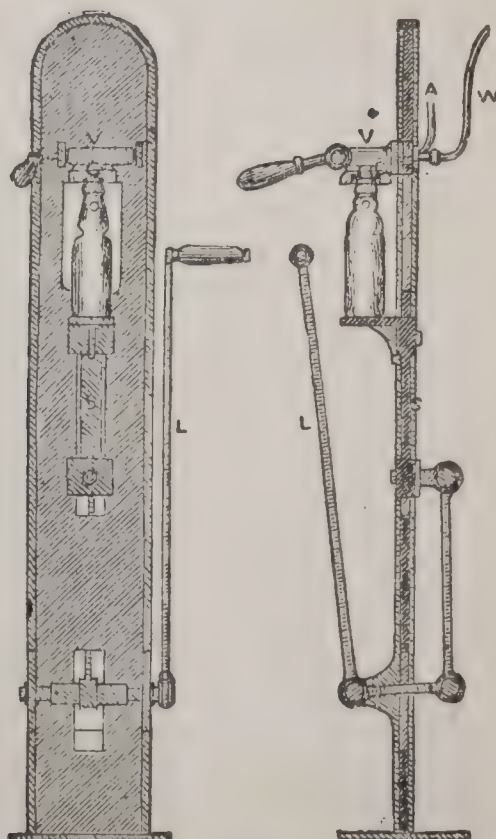
Oriental Goat-skin Bottles.



Bothriocephalus.



Bottony.



Codd's Bottling Machine.

BOTTLE CHART—BOTTLE-GOURD.

botte, a bunch: mid. L. *butic'ula*, a kind of water-vessel—from L. *butica*; Gr. *butis*, a flask: It. *bottiglia*]: a vessel with a narrow neck for holding liquids; the quantity contained: V. to shut up into a bottle. Bottles are now usually made of glass or earthenware (see GLASS); but the first bottles were made of the skins of animals, mostly goats. Of this kind were the bottles spoken of in Scripture. Skin bottles are still used in s. Europe for wine, and by tribes of Africa and Asia for water. The ancient Egyptians made bottles of most elegant form and exquisite workmanship of alabaster, stone, gold, ivory, and other substances. The Italian peasants carry, slung round their necks, bottles made of the rind of the gourd, which, when dry, is as hard as wood. BOTTLING, imp. *bit'ling*: N. the operation of putting into bottles, as a liquor. BOTTLED, pp. *bit'tld*: ADJ. that is put in bottles; in *OE.*, having a protuberant belly. BOTTLE-HEAD, a sort of whale. BOTTLE-NOSED, with a nose full and swollen at the end. BOTTLE-HOLDER, one who administers refreshment to a combatant; a backer; a second—usually in a prize-fight.

BOTTLE CHART: chart purporting to show the track of bottles containing papers, sealed, and thrown from ships into the sea, in the hope that these fragile messengers may be picked up, and their intelligence reach its proper destination. It was suggested that by such means the determination of currents might be illustrated. Lieut. Becher, English naval officer, constructed, 1843, a chart of bottle-voyages in the Atlantic, his facts being drawn from the numerous cases that had occurred. The time which elapses between the casting of the bottle from the ship and the finding it on shore, or picking up by some other ship, has varied from a few days to 16 years; while the straight-line distance between the two points has varied from a few miles to 5,000 m. Of the actual length of the curved line followed by the bottle, little or nothing is known; but some are believed to have exceeded 8,000 m. The Bottle Chart has been re-edited and re-engraved from time to time, and published in the *Nautical Magazine*; it is marked by several hundred straight lines, each drawn from the lat. and long. of the start to the lat. and long. of the finding.

BOTTLE-FLOWER: the *Centaurea cyanus*.

BOTTLE GLASS: see GLASS.

BOTTLE-GOURD (*Lagenaria*, from Lat. *lagena*, a bottle): genus of plants of the nat. ord. *Cucurbitaceæ* (q.v.), nearly allied to the Gourd (q.v.) genus (*Cucurbita*), in which it was until recently included. One of the most marked distinctions between them is the very tumid border of the seeds of the Bottle-gourds, which have also all the anthers separate, and have white flowers, while those of the Gourds proper are yellow. The common B., or False Calabash (*Lagenaria vulgaris*), native of India, is now common almost everywhere in warm climates. It is a climbing, musky-scented annual, clothed with soft down, having its flowers in clusters, and a large fruit from 1 ft. to even 6 ft. in length, usually shaped like a bottle, an urn, or a club.

BOTTLEHEAD.

The fruit has a hard rind, and when the pulp is removed, and the rind dried, it is used in many countries for holding water, and is generally called a *cucurbit* (q.v.). The B., in its wild state, is very bitter and poisonous, and even in cultivation some of its varieties exhibit not a little of the bitterness and purgative properties of colocynth (q.v.). Other varieties, however, have a cooling edible pulp—in general those which attain the greatest luxuriance. The B. appears to have been introduced into Europe about the close of the 16th c., but requires for advantageous cultivation a warmer climate than that of any part of Britain, where it is known chiefly as an object of curiosity. It is much cultivated in warmer countries as an esculent, and is an important article of food to the poorer Arabs, who boil it with vinegar, or make a pudding of it in its own rind with rice and meat.

Another species, *L. idololatrica*, is a sacred plant of the Hindus, much employed in their religious ceremonies.

BOTTLE'HEAD (synon. *Bottlenose Bottleheaded Whale*, *Bottle-nosed Whale*, *Beaked Whale*, *Sperm-whale Porpoise*): cetaceous animal (*Hyperoodon rostratus*) of family *Ziphiidæ*, intermediate between sperm-whales and dolphins, and differing noticeably from the latter in having very few teeth developed, if any, instead of very many; the dorsal



Bottlehead.

fin short, of five digits included in the skin. *H. rostratus* has been described under many synonyms, such as *bidentis*, *semijunctus*, *butzkopf*, etc., and sometimes confounded with the Bottle-nose Dolphin (*Tursiops tursio*), of similar range in the n. Atlantic, and common especially at Cape May. It differs from genera in its own family, such as *Mesoplodon*, the Cow-fish, in having a longer beak and the teeth concealed (not referring here to the Cow-fish (*Grampus*) of the Dolphin family). The beak though longer, is comparatively short; the forehead rises suddenly from the beak and is remarkably elevated,



Skull of Bottlehead.

a peculiarity due to large, bony crests rising over the bones of the upper jaw. The teeth are only two in number, in the fore part of the lower jaw, pointed, but much enveloped by the soft parts, and sometimes completely hidden among them: the palate and upper jaw are furnished with little

BOTTOM—BOTTOMRY.

hard points or tubercles, not $\frac{1}{10}$ of an inch in height, which, however, have been doubtfully regarded as a kind of false teeth, and by Cuvier as rudimentary vestiges of whale-bone. There is a dorsal fin rather small in proportion to the size of the animal, and placed further back than in the common dolphin. The blowhole is crescent-shaped, the points of the crescent directed backward. The skin is smooth and glossy, of a blackish lead color on the back, gradually becoming lighter on the sides and whitish on the belly. The animal attains a length of about 25 ft.

The B. has occasionally been caught in consequence of its having entered harbors or the mouths of rivers. One was caught above London Bridge, figured and described by Hunter, *Philosophical Transactions*, 1787.

The name BOTTLE-NOSED WHALE has been given also to a species of dolphin (q.v.)

BOTTOM, n. *bŏt'tŏm* [AS. *botm*; Dut. *bodem*; Ger. *boden*; Icel. *botn*, the lowest part. F. *bout*, that part of a body which touches or pushes first], the lowest part of anything; the foundation or base; that on which anything rests; the deepest part of a subject; the lowest part of a declivity; the low ground; the end; natural strength; a ship, so named from its bottom or shell. V. to found or build upon; to rest upon as a support. **BOT'TOMING**, imp. **BOTTOMED**, pp. *-tŏmd*: **ADJ.** having a bottom or basis. **BOT'TOMLESS**, a. without a bottom; very deep. **AT BOTTOM**, in reality. **ON ONE'S OWN BOTTOM**, independent or independently. **BOT'TOMRY**, n. *-rĭ*, money borrowed on the security of the bottom of a ship—that is, of the ship itself. **BOT'TOMS**, n. plu. the deepest working parts of a mine.

BOTTOM, n. *bŏt'tŏm* [W. *botum*, a button—from *bot.*, a round body]: a ball of thread wound up; a cocoon.

BOT'TOM, in Naval Language: either the whole ship itself, or that part of it under water when laden. Commodities are often said to be imported 'in foreign bottoms,' or in 'American bottoms,' in which cases the phrase is applied to the whole ship. A 'full ship,' or a 'full B.,' denotes such a form given to the lower half of the hull as to allow the stowage of a large amount of merchandise. A 'sharp ship,' or a 'sharp B.,' implies a capacity for speed.

BOTTOM-GLADE: a glade in the lower part of a valley; a dale.

BOT'TOMRY, **BOND** OR **CONTRACT OF**: a security by which a ship itself is expressly mortgaged and pledged by the owner or master, or *hypothecated* for repairs to the ship, or for money advanced for its outfit, or otherwise with relation to it. It is called a security by *B.*, because the bottom or keel of the ship is figuratively used to express the whole of it. The loan or debt is repayable only in the event of the ship's safe arrival at the port or destination; and in consideration of this risk the lender or creditor exacts a premium, the amount of which depends on the nature of the adventure. If the ship be totally lost the lender loses his money; but if she returns safely

BOTTONY—BOTZEN.

he recovers his principal, together with interest at the rate agreed upon. These contracts are not treated as ordinary mortgages, and preferred according to the order of date; but inversely the latest is preferred to the preceding, because it is presumed that the last loan saved the ship, and in all cases necessity alone is the condition of the contract. An act of congress, 1850, July 29, requires mortgages, bills of sale, hypothecations, and conveyances of vessels, to be recorded in the office of the collector of customs where such vessel is registered; otherwise they are invalid against all persons that have no notice thereof, except the grantor or mortgager and his heirs and devisees. The same act also declares expressly that a lien by bottomry made on any vessel, during her voyage, by loan for necessities to repair or enable the vessel to continue the voyage, shall not lose priority, nor be in any other way affected by the provisions of that act. The seamen's lien for wages has priority to that of the holder of a B., and owners are also personally liable for the wages of seamen. When the holder of a B. is obliged to pay the seamen's lien he is entitled to compensation from the owners and has a lien upon the proceeds of the vessel for his reimbursement. A B. usually provides that in case of damage to a vessel, not amounting to a total loss, the lender shall bear his proportional share of the loss. See **RESPONDENTIA: MERCHANT SHIPPING ACT.**

BOTTONY, n. *bŏt'tŏn-ĭ* [OF. *botoné*, furnished with buttons or buds]. a bud-like projection, of which in general three are together. They may be seen in the cross bottony, which is a cross, each of the four extremities of which terminates in three bud-like prominences. They present a certain remote resemblance to the leaf of a trefoil plant.

BOTTS, *bŏts*, **JOHN MINOR**: 1802–69; b. Va.: lawyer and politician. He was elected to the legislature of his state, 1833, and several times later; became member of congress, 1839, and took sides with Henry Clay in favor of the tariff and the distribution of the public domains. When Tyler left the party that had raised him to the presidency, B. abandoned him, although he had been for a long time a personal friend. During the civil war he remained faithful to the Union; and afterward was one of the signers of Jefferson Davis's bail-bond. He is author of *The Great Rebellion; its Secret History*.

BOTULIFORM, a. *bŏt'ŭl-ĭ-fawrm* [L. *botulus*, a sausage; *forma*, form, shape]: sausage-shaped.

BOTZEN, or **BOZEN**, *bŏt'sèn* (Ital. **BOLZANO**): important trading town of the Austrian Tyrol, about 32 m. n.n.e. of Trent. B. is well built, with good streets and arcades, and streams of pure water are conducted through the principal thoroughfares in little canals. It is protected from the inundations of a mountain-torrent in the vicinity by a strong wall about two m. in length. Its situation on the Brenner railway and at the junction of the roads from Germany, Italy, and Switzerland, makes it an important

BOUCH—BOUCHES-DU-RHONE.

entrepôt. It has manufactures of silk, linen, hosiery, leather, etc., and four extensive annual fairs. Wine and fruits in abundance are produced in the environs. Pop. (1880) 10,641; (1890) 11,655.

BOUCH, v. *bûsh* [F. *bouche*, mouth, entrance—from L. *bucca*, the cheek, the mouth; Gael *bus*, a mouth]: to make a mouth into; to drill a new vent in a gun which has been spiked: N. the piece sloped out of the upper part of a shield of the fifteenth and sixteenth centuries, to allow the lance free motion. BOUCHING, imp. BOUCHED, pp. *bûsht*.

BOUCHAIN, *bô-shāng'*: fortified town of France, dept. of Nord, 12 m. s.e. of Douai, intersected by the Scheldt and possessing the means of laying the adjacent country under water in the event of an attack. It was taken by the Duke of Marlborough, 1711, and recaptured by the French in the following year, to whom it was finally ceded by the treaty of Utrecht. The chief business is extracting sugar from beet-root, and refining salt. Pop. (1891) 1,859.

BOUCHER, *bô-shā'*, FRANCIS: 1704–70; b. Paris: painter. After studying there under Francis le Moine, he went to Rome to prosecute his art. After a short residence there he returned to Paris, and, on the death of Vanloo, was appointed principal painter to Louis XV. B. was equally facile in the production of figure or of landscape pictures—a facility fatal to the claims that his genius might otherwise have had on posterity. In many of his paintings picturesque effect is the only thing sought, at whatever cost to truth. He has been called the Anacreon of painting on account of the amorous character of many of his works; mythological and pastoral subjects were also great favorites with him. At his death he was director of the French Acad.

BOUCHER, *bô-shā'*, PIERRE (SIEUR DE BOUCHERVILLE): 1622–1717; b. France; d. Canada: historian, pioneer, and Huron interpreter, who came to Canada (then called New France) 1635. In 1661 the colony sent him to France as deputy, and soon afterward he published his *History of New France, Histoire véritable et naturelle des mœurs et productions de la Nouvelle-France* (Paris, 1665, 12mo.). He was appointed gov. of Three Rivers. B. was an exemplary man, the ancestor of some of the best families in Canada. A short time before his death he addressed to his children *The Adieus of Grandfather Boucher*.

BOUCHES-DU-RHÔNE, *bôsh-dû-rôn'*: department in the s.e. of France, formerly a part of Provence; at the mouths of the Rhone, lat. 43° 10'—43° 56' n., and long. 4° 13'—5° 40' e.; 1,970 sq. m. It is divided into three arrondissements—Marseille, Aix, and Arles—which are subdivided into 29 cantons and 109 communes. Through the n. and e. districts, the Maritime Alps, which send out some calcareous ridges southward, slope gently down to the basin of the Rhone. Toward the sea-shore, there are several plains of considerable extent. About one-half of the department is under cultivation; heaths, wood, wastes,

BOUCHETTE.

and water occupy the other half. The Rhone—which between Arles and the sea separates into several branches, forming a delta, called *Ile de la Camargue*—and its affluent, the Durance, are the principal rivers. The dept. is intersected by several canals of importance, and the aqueduct to convey the water from the Durance to Marseille, is one of the most extensive works of the kind in existence, being no less than 51 m. long, including 15 m. of tunneling. The *Ile de la Camargue* produces corn and rice, and affords pasture for large numbers of sheep and cattle. The vine, olive, and mulberry thrive here, and timber is plentiful. The soil in some parts, however, is strongly impregnated with salt. The great plain of Crau, which extends along the e. branch of the Rhone, is stony and arid, except in a few spots, where the vine and olive are successfully cultivated. Beside the Etang de Berre (q. v.), there are numerous salt-lakes, communicating with the sea by natural or artificial channels. Marble, limestone, and gypsum are found in the Bouches-du-Rhone. Leather, hats, perfumes, soap, olive-oil, vinegar, and chemical products are manufactured; there are extensive brandy-distilleries, sugar-refineries, and salt-works, and the produce of wine is large. B. has an active commerce with the Levant, Africa, Spain, and the W. Indies. Pop. (1891) 604,857; (1901) 734,347.

BOUCHETTE, *bô-shët'*, JOSEPH: Canadian topographer: 1774–1841, Apr. 9: b. Canada; son of Com. B. At the age of 16 he entered the office of his uncle, the Brit. N. Amer. surveyor-gen., whom he succeeded in office 1804. In the war of 1812 he served against the United States. He was engaged 1817–8 in establishing the line between the Brit. possessions and the United States. His topog. and geog. description of Canada was published, London 1816. He pub. also *The British Dominions of North America* (1831) descriptive and statistical; *Topographical Dictionary of Lower Canada* (1832).

BOUCICAULT—BOUDOIR.

BOUCICAULT, *bô' sê-kô*, DION: British playwright: 1822, Dec. 26—1890, Sep. 18; b. Dublin, Ireland. He was educated for an architect and civil engineer; but turned to dramatic writing, and at the age of 19 produced, in connection with John Brougham, *London Assurance*, which was acted at Covent Garden, London. The play had great popularity. He married Agnes Robertson, and 1853-60 lived in the United States. Returning to London, he produced at the Adelphi Theatre 1860 his first Irish play, *The Colleen Bawn*, which gained immediate fame and still holds the stage; also 1861 *The Octoroon*, strongly depicting the evils of American slavery. More than 100 dramas rapidly followed from his prolific pen, among which were *Relief of Lucknow* (1863); *Streets of London* (1865); *Arrah-na-pogue* (1865), in which B. appeared as Shaun in Booth's Theatre, New York, 1872; *Rip van Winkle* (1865), made famous by Joseph Jefferson's acting; *The Flying Scud* (1866); *Hunted Down* (1866); *Foul Play* (1867) in collaboration with Charles Reade; *After Dark* (1868); *Formosa* (1869); *Daddy O'Dowd*, Irish play, acted 1873 at Booth's Theatre; *Mora and Mimi*, acted 1873 at Wallack's; *The Shaughraun*, acted 1876 at Wallack's, one of the most successful of his plays. A leading American critic has characterized B's plays as original, not in plot, but in general treatment, including action and incident, and as singularly bright in dialogue. He had a skilful dramatic judgment. He married 1889 a young Amer. actress, Louisa Thorndyke, though the validity of his divorce from his former wife was questioned.

BOUDINOT, *bô de-not*, ELIAS: 1740-1821; b. Philadelphia: patriot and philanthropist; great-grandson of Elias B., a French Huguenot who fled to America after the revocation of the edict of Nantes. He was a successful lawyer, and one of the first advocates of colonial liberty. Congress appointed him commissary-gen. of the prisoners in 1777, and the same year he was elected member of congress. He became pres. of that body, 1782, and as such signed the treaty of peace, 1783. In 1796 Washington appointed him superintendent of the mint. He resigned 1805, and resided after that at Burlington, N. J. In 1816 he became the first pres. of the American Bible Soc. He gave 16,000 acres of land and large sums of money to charitable institutions. He wrote a number of works. The principal are: *Age of Revolution; or, The Age of Reason an Age of Infidelity*, a reply to Paine (1790); *Star in the West: or, An Attempt to Discover the Long-lost Tribes of Israel* (1816), pointing to the Indians as the lost tribes.

BOUDINOT, ELIAS (the Cherokee): d. 1839, June 10; one of three Cherokee youths brought by missionaries to a school in Cornwall, Conn., 1818. Elias Boudinot, the philanthropist, who took an interest in the education of the Indians, allowed one of those boys to adopt his name. He afterward became a leading man in his tribe.

BOUDOIR, n. *bûd'wôr* [F. *boudoir*—from *bouder*, to pout, to sulk—*lit.*, a place to sulk in]: a lady's small private apartment, such as a dressing-room, in which she receives only her most intimate friends. Boudoirs as

BOUFARIK—BOUFLERS.

rooms to which numerous friends were admitted at early hours—almost after the manner of a public reception—became fashionable in France during the reign of Louis XIV., and so continued during the following reign. The example having been set by Madame Pompadour, Madame Dubarri, and other royal mistresses, it became indispensable for every lady of fashion to have her B., which was adorned with the most fantastic luxuriousness.

BOUFARIK, *bôfâ-rêk'*: village of Algeria, province of Algiers, 16 m. s. of Algiers; important military station on the road from Algiers to Blidah and Oran. It has well-frequented markets, and a considerable trade in corn, cotton, olives, oranges, tobacco, raisins, and cattle. Pop. (1891) 7,243.

BOUFLERS, *bô flür'*: LOUIS FRANÇOIS, Duke of, peer and marshal of France: 1644–1711; descended from one of the most ancient and noble families of Picardy; distinguished general. He began his military career as a lieut., and rose very rapidly in rank. Under the great Condé, Turenne, Crequi, Luxembourg, and Catinat, he fought with distinction in Germany and the Netherlands. His defenses of Namur 1695 and of Lille 1708, are famous. The siege of the former place, conducted by King William III. of England, cost the allies more than 20,000 men; and although Louis XIV. sent to B. an order written by his own hand for the surrender of the place, yet he did not surrender it until all the means of defense were exhausted. After the defeat of Malplaquet he led the French army so admirably that the retreat seemed rather a triumph than the consequence of a lost battle. He was a man of highly honorable and upright character. He died at Fontainebleau.

His son, JOSEPH MARIE, Duke of Bouflers, Marshal of France, 1706–47, d. at Genoa.

BOUFLERS, STANISLAS, Marquis de, commonly styled the Chevalier de Bouflers: 1737–1815, Jan. 18; b. Luneville, France; son of the Marquis Bouflers-Remiencourt, who was captain of the guard to Stanislas, King of Poland, and his mother was long one of the brightest ornaments of the Polish court. He entered the French military service, and was very soon made gov. of Senegal, in which capacity he introduced many regulations very useful to the colony. After his return, he applied himself to the light literature of the time of Louis XV. He was chosen a member of the national assembly 1789, in which he showed great moderation; but after 1792, Aug. 10, he forsook France, was hospitably received at the court of Prussia, and received the gift of a large estate in Poland, in order to establish upon it a colony of French exiles. Having returned to France, he again gave his attention, after the year 1800, entirely to literature. In 1804, he entered as an old academician into the Institute reorganized by Napoleon. The monument on his grave bears this inscription, dictated by himself: *Mes amis, croyez que je dors* (My friends, believe that I sleep). A collection of his works

BOUGAINVILLE—BOUGHT.

was published after his death (8 vols. Par. 1815). His letters from Switzerland are especially noticeable; from this work an idea may be formed of the amiable character and intellectual liveliness of its author.

BOUGAINVILLE, LOUIS ANTOINE DE: 1729, Nov. 11—1811, Aug. 31; b. Paris, son of a notary; famous French navigator. He studied in Paris and attained great proficiency in languages and science. In 1754, he went as sec. of the French embassy to London. In 1756, he acted as aide-de-camp to the Marquis of Montcalm, to whom the defense of Canada was intrusted. At the head of a select detachment he burned an English flotilla; and through his advice and example a corps of 5,000 French, 1758, June, successfully withstood an English army of 24,000. In the campaign of 1761, in Germany, he served with distinction. After the peace he entered the naval service, in which he soon signalized himself. After having been obliged to give up a project of founding a settlement on the Falkland Islands he undertook a voyage round the world (1766, Dec. 15—1769, March 16) with a frigate and a St. Malo transport, the first voyage round the world which the French ever accomplished. He gave an account of it in his *Description d'un Voyage autour du Monde* (2 vols., Par. 1771-2). Geography and other branches of science were enriched by it with many discoveries. In the North American war, B. commanded several ships of the line, and in 1779, was made *chef d'escadre*; in the following year he was made a field-marshal in the army. After the outbreak of the Revolution he retired from public service, and engaged entirely in scientific pursuits.

BOUGAINVILLEA, *bô-géan-vil-lê-a*: plant of the order *Nyctaginaceæ*, largely cultivated in greenhouses for the beauty of its purple bracts; the name is also used of a genus of hydroid zoophytes.

BOUGAINVILLE BAY, *bô-găng-rêl'*: named—as were also the island, the strait, and the plant—from the French navigator Bougainville (q.v.), a contemporary of Cook. It is in Patagonia, on the n. side of the Strait of Magellan, lat. 53° 25' s., long. 70° 13' w.

BOUGAINVILLE ISLAND: one of the Solomons, in the w. section of Polynesia, sometimes distinguished from the e. section as Melanesia. B. is between lat. 5° 30' and 7° 2' s., and in long. 155° e.; mountainous, well wooded, and populous.

BOUGAINVILLE STRAIT: in the New Hebrides, between Mallicollo and Espiritu Santo.

BOUGH, n. *bow* [AS. *bog*—from *bugan*, to bend: Icel. *bógr*, the shoulder of an animal]: a branch or arm of a tree.

BOUGHT, *bawt*: pt. of **BUY**, which see.

BOUGHT, n. *bowt* [AS. *bugan*, to bow or bend: Dan. *bugt*, a bend, a turn, a bay (see **BOUT**)]: the separate folds of a rope when coiled in a circle; a twist; a link; the part of a sling which contains the stone.

BOUGHT AND SOLD NOTES are notes of sale signed by a broker employed to sell goods, and by which the bargain through him is completed. See **BROKER: SALE OF GOODS**: also **PAROLE EVIDENCE**.

BOUGHTON, *bow'tun*, **GEORGE HENRY**: artist: b. Norfolk, England, 1836. When about three years of age, his parents brought him to Albany, N. Y. In his spare moments he made pen-and-ink sketches, and attempted painting on canvas. His work attracted attention; and with the money obtained from the sale of some paintings, 1853, he went to London, where he studied for a few months, after which he returned to Albany; but soon removed to New York, where he gave special attention to landscape-painting, and was remarkably successful. He studied in Paris 1859-61, and in the latter year removed to London, where he has since resided. He was elected a member of the National Acad. in New York 1871, and an associate of the Royal Acad., London, 1879.

BOUGIE, n. *bô'zhê* [F. *bougie*, a wax-candle—so named from the town *Bougie* in Algeria]: a wax-taper; a long slender instrument, made of elastic gum, wax, or metal, for removing obstructions in the bladder, and for distending contracted mucous canals, such as the gullet, bowels, or urethra: see **STRICTURE**. For the urethra they are generally of German silver or rubber, and vary from .125 to .25 inch in diameter. Still larger sizes are used in some cases.

BOUGUER, *bó-gär'*, **PIERRE**: 1698, Feb. 16—1758; b. Croisic, Bretagne: French mathematician and natural philosopher. He studied in the Jesuit College at Vannes. In 1713, he succeeded his father as prof. of hydrography in Croisic, from which he was removed to a similar office at Havre 1730. In 1729, he published his *Essai d'Optique sur la Gradation de la Lumière*. In 1731, he was made associate geometer of the Acad. of Sciences, and promoted to the office of pensioned astronomer 1735. In that year, also, he was chosen to go with Godin and De la Condamine, to S. America for the measurement of a degree of the meridian at the equator. B. and his companions met many difficulties, and were absent more than seven years, during which time B. made valuable observations on the length of the seconds' pendulum at great elevations, the deviation of the plumb-line from a vertical position through the attraction of a neighboring mountain, the limit of perpetual snow, the obliquity of the ecliptic, etc. He published an account of his labors and those of his colleagues in a magnificent work, *La Figure de la Terre déterminée par MM. Bouguer et De la Condamine* (Par. 1749), which, however, involved him in an unpleasant controversy with De la Condamine concerning their respective shares of merit in the researches in which they had been jointly engaged. B.'s investigations concerning the intensity of light laid the foundation of photometry; and their results, partly exhibited in the optical work already

BOUGUEREAU—BOUILLON.

noticed, were more fully embodied in his *Traité d'Optique sur la Gradation de la Lumière*, edited after his death by Lacaille (Par. 1760). He invented the heliometer in 1748, which has of late been brought to greater perfection by Fraunhofer. He published an excellent work on navigation (Par. 1753).

BOUGUEREAU, *bôg-rô'*, GUILLAUME ADOLPHE: artist painter: 1835, Nov. 30—————; b. La Rochelle, France. While employed in a mercantile house at Bordeaux, he studied drawing two hours a day, and at the end of a first year won the highest prize. This success led him to adopt painting as a profession. First he entered the studio of Picot in Paris, and later became a pupil in the School of Fine Art. He visited Rome 1850. In the fine art exposition of 1854 he had a painting, *Body of St. Cecilia Borne to the Catacombs*, and since that time he has held rank among the best painters of France. Among his works are: *Philomela and Procne*; *Vierge Consolatrice*; *Harvest Time*; *Homer and His Guide*; *Youth of Bacchus*; *The Scourging of Our Lord*.

BOUILLÉ, *bô-yâ'*, FRANÇOIS CLAUDE AMOUR, Marquis DE, general in the French army: 1739–1800; b. at the castle of Cluzel, in Auvergne. He entered the army at the age of 14 and served in Germany during the Seven Years' War. In 1768, he was appointed gov. of the island of Guadeloupe, and afterward gov. gen. of Martinique and St. Lucia, and commander-in-chief of all the French forces in the W. Indies, capturing Dominica and other important islands from the British 1778–82. His humanity and generosity were equal to his valor and skill. He received the rank of lieut.gen. 1782. In 1784, he visited England, and was received with extraordinary respect. In 1790, he was made commander-in-chief of the army of the Meuse, the Saar, and the Moselle. His decision of character prevented the dissolution of the army and the outbreak of civil war. For his share in the attempted escape of Louis XVI. he had to flee from France and went to Coblenz to the king's brothers; and in 1791 entered the service of Gustavus III. of Sweden, and after the assassination of that monarch he served in the corps of the Prince of Condé. Rejecting the chief command in La Vendée, proposed to him by the French princes 1793, he went to England, where he wrote *Mémoires sur la Révolution Française*—a truthful and useful work. He died in London.

BOUILLI, n. *ból'yê* [F.—from *bouillir*, to boil—from L. *bullirē*, to bubble]: meat boiled or stewed with vegetables. BOUILLON, n. *ból'yōng*, soup; broth; a disease in horses, consisting of a fleshy excrescence on the heel.

BOUILLON, *ból-yōng'* or *bô-yōng'*: a duchy, originally German, in the Belgian part of the grand duchy of Luxembourg, consisting of a woody and hilly district in the Ardennes, about 157 sq. m. This duchy was the possession of the famous crusader, Godfrey (q.v.) of Bouillon, who, in order to raise money for his crusade, pledged it, in 1095, to the Bishop of Liege. It was conquered by

BOUILLON—BOULANGER.

France in the war of 1672, and bestowed by Louis XIV., 1678, upon his grand chamberlain, Latour d'Auvergne. By the peace of 1814 the greater part of it was included in the grand duchy of Luxemburg; and the sovereignty of it passed to the king of the Netherlands, who, 1821, purchased the proprietary rights from the heir. By the revolution of 1830, B., with Luxemburg, was separated from the Netherlands, and in 1837 united to Belgium. Pop. 21,000. The principal town is Bouillon, between steep hills on the Semoy, with a strong castle on a rock, formerly the residence of the Dukes of Bouillon. Pop. 2,500.

BOUILLON, GODFREY: see GODFREY OF BOUILLON.

BOUILLY, *bô-ye'*, JEAN NICOLAS: 1763–1842, April 24; b. Boudray, near Tours: prolific French dramatic writer. He was a strong partisan of the Revolution 1790; but afterward, in public office, showed moderation. He was active in introducing elementary schools in France.

BOULAC, or BOOLAK, *bô-lâk'*: the port of Cairo, on the Nile, about one m. from Cairo, and is supposed the site of the ancient Litopolis. It is a crowded town, extremely dirty, with very narrow and irregular unpaved streets. It contains the custom-house and warehouses of Cairo, cotton, paper, and sugar factories, a printing press, and the famous museum of antiquities of the Nile land. Pop. abt. 10,000.

BOULAINVILLIERS, *bô-lăng-ve-ye-ă'*, HENRY, Count: 1658, Oct. 11—1722, Jan. 23; b. St. Saire, Normandy: French author, descended from an ancient family in Picardy. He regarded the feudal system as the most perfect creation of human wisdom, and his writings are amusing by their extreme aristocratic sentiments.

BOULANGER, *bô-lông-zhă'*, GEORGES ERNEST JEAN MARIE: 1837, Apr. 29—1891, Sep. 30; b. Rennes, France: soldier. He was educated at St. Cyr; served in the Kabyle Expedition, the war with Italy, and the expedition to Cochin China; was chief of battalion in the Franco-German war; was head of the French delegation to the American centennial celebration; served two years in Africa; was promoted gen. of div. 1884; and was appointed minister of war, 1886, Jan. 7. He aided in procuring the expulsion of the Orleans princes from France; inaugurated many reforms in the army; went out of office with De Freycinet's cabinet; was court-martialled and placed on the retired list of the army 1888 for violation of milit. discipline, and the same year was elected to the chamber of deputies. Here he advocated radical changes in the constitution, and was censured for denouncing the ministry. He provoked Premier Floquet to challenge him to a duel 1888, July, and was severely wounded. He fled to Brussels 1889, Apr. 1; was tried and convicted (in contumacy) by the French senate on charges of high treason, conspiracy, embezzlement, and official corruption, in Aug.; made his headquarters for some time on the island of Guernsey; and killed himself in a cemetery near Brussels.

BOULAY DE LA MEURTHE—BOULDER-CLAY.

BOULAY DE LA MEURTHE, *bô.lâ'dêh lâ-wért*, ANTOINE JACQUES CLAUDE JOSEPH, Count: 1761–1840, Feb. 2; b. Chaumousey, France: statesman. He opposed the Jacobites and the Directory in the Council of Five Hundred; was pres. of the legislative section of the council of state under the empire; was taken to Germany by the Russians after the second restoration; and returning to Paris 1819, lived in retirement till his death. He adhered faithfully to the cause of Napoleon, and was created a count of the empire. His publications include: *Essay on the Causes Which Led to the Establishment of the Commonwealth in England* (1799); *Political Picture of the Reigns of Charles II. and James II.* (1818).

BOULDER: city, cap. of Boulder co., Col., near the e. base of the Rocky Mts., 30 m. n.w. of Denver; at junction of several branches of the Union Pacific r.r. It is a central point for a rich mining region of gold, silver, iron, and coal; has excellent schools, the state univ., 7 churches, 1 daily and 3 weekly papers, fine water supply, and electric lights. Pop. (1900) 6,150.

BOULDER, or BOWLDER, n. *bôl'dêr* [Dut. *bolle*, a globe: F. *boule*, a ball or sphere of wood, metal, etc.: Icel. *bolr*, the round trunk of a tree: prov. Sw. *bullersten*, the larger kind of pebbles: L. *bullâ*, any small round body]: in *geol.*, a rounded or water-worn block of stone found embedded in the clays and gravels of the drift formation; the rounded stones found on the surface of the earth, or on the seashore.—*Erratic Boulders* are large masses of rock found at a distance from the formations to which they belong. The term is generally applied when they are found lying detached on the surface; in which case they may have been washed out of the Boulder-clay (q.v.) or carried separately by glaciers, and dropped. Large blocks of Scandinavian rocks are found scattered over the plains of Denmark and n. Germany, and frequently are striking features in the landscape. The pedestal of the statue of Peter the Great in St. Petersburg was hewn out of a large erratic boulder, 1,500 tons in weight, from a plain near by. A large one forms a rocking-stone at Fall River, Mass.

BOULDER-CLAY, or DILUVIUM, or DRIFT, or TILL: post-pliocene bed of a remarkable character, but no longer of a mysterious history. It occurs usually as the lowest or first of that group of beds which geologists recognize as the post-tertiary, post-pliocene, and recent, now called quaternary. The only exception is when a bed of sand intervenes—as is rarely the case—over the surface of the subjacent rocks. It consists of a compact clay, blue or red, according to the prevalent character of the subjacent rocks, having boulders diffused throughout its mass, and with here and there thin lenticular beds of gravel and sand interspersed. In some places in Scotland it is not less than 70 ft. thick. In America, it extends to about the 38th parallel; in Britain, it terminates a little n. of London. The boulders, the most striking feature of this bed, differ in size from a small pebble to masses many tons in weight

BOULEVARD.

They are portions of rocks of all ages, more or less worn. The older rocks, when from a distance, are rounded, while those that have been broken from rocks in the district are more angular. These masses are scattered without order in the clay, the heaviest blocks occurring frequently in the upper portion of the bed. Nor is there any indication of their having sunk in the clay from gravity—the clay seems to have been so viscid when the materials assumed their present position, as to have successfully resisted the immense pressure of these enormous blocks. The boulders have not that rounded appearance produced by the action of water in a river-course or on the shore between high and low water marks. They have a greater or less number of *rubbed faces*, produced evidently by being forced, while held in one position, over the solid rocks beneath. The rubbed and scratched surfaces exhibited on these rocks, when the superincumbent clay is removed, plainly testify to their origin. Several interesting examples of such rubbed surfaces are in the neighborhood of Edinburgh. A careful observer can determine from the scratchings the direction of the current which bore with it the rubbing boulders. In the district to which we have alluded, these indicate a current from the west. The general direction, however, in America, in Britain, and in Scandinavia, seems to have been from the poles toward the warmer regions of the earth.

The B. contains no fossils strictly its own. Organisms exist in the boulders obtained from the older fossiliferous rocks, but no indications have hitherto been observed of a fauna or flora belonging to the period of the deposition of this bed. In the brick clays and gravels overlying it in Scotland are shells of arctic character.

The origin and structure of this remarkable bed have been a puzzle to geologists. That it was produced by the Noachian deluge, as was universally believed not many years ago (whence its former name *Diluvium*), finds now no supporters. The present approved explanation assigns it to the action of great glaciers that covered much of the northern hemisphere, the age ending 5,000–7,000 years ago, according to recent calculations based on the recession of Niagara Falls and other data. The boulder-clay was the finer detritus from the grinding of the glaciers, and the planed boulders frozen into the ice beneath, while immense quantities of rock, gravel, and sand were borne on the surface or in the body of the glacier. See GLACIER.

BOULEVARD, or BOULEVART, n. *bûl-vâr'* [F. *Boulevard*; Ger. *bollwerk*, a bulwark or rampart—from Dut. *bolle*, a bend: Dan. *bull*, the trunk of a tree: Ger. *bohle*, a plank; *werk*, work, defense (see BULWARK)]: the principal palisaded defense or fortification around a town or village; the rampart of a fortification; a public promenade planted with trees, often occupying the site of the old ramparts of a town. In France and Germany these ancient works have generally been levelled, the ditches filled up, and the space thus obtained employed for parks, promenades, and

BOULOGNE—BOULOGNE-SUR-MER.

streets lined with trees; which in France still bear the name of B. Thence in some other countries, notably the United States, the term B. has come to be applied loosely to a broad, prominent street, especially if raised on an embankment. The boulevards of Paris are celebrated, and are of great service as open spaces promoting the circulation of air amid the dense mass of habitations. Some parts of them present a very dazzling spectacle, and as a whole they afford a striking exhibition of the life and character of the French capital in all the different classes of society. The *Boulevard des Italiens* is particularly known as the rendezvous of the fashionable, and the *Boulevard du Temple* as the place where the small theatres are to be found which are frequented by the common people and the inhabitants of the suburbs, for which reason the expression *Théâtre de Boulevard* is often employed to denote a theatre for the common people, or one of an inferior kind. The Thames Embankment, London, is essentially a Boulevard.

BOULOGNE, *bô-lôn'*, Fr. *bô-lôn'*: town of France, dept. of the Seine, on the right bank of the river Seine, about 5 m. w. of Paris, from which it is separated by the Bois de Boulogne. A fine stone bridge of 12 arches crosses the Seine from B. to St. Cloud. Pop. (1901) 44,416.

The Bois de Boulogne is traversed by many walks, through the broadest of which the fashionable world of Paris travels in Easter-week to the Abbey of Longchamp. At the entrance of the wood lies Auteuil (q.v.). During the Revolution the trees of the older walks were mostly cut down; but when Napoleon chose St. Cloud, in the immediate neighborhood, for his summer residence, new walks were planted and laid off, and the inclosing walls were restored. This wood, which from ancient times to the present day has been a place of enjoyment and recreation to the Parisians, was again much injured during the siege of 1870-1.

BOULOGNE-SUR-MER, *bô-loñ'sür-mär*: fortified seaport in the dept. of Pas-de-Calais, France, at the mouth of the Liane, in the English Channel, about 19 m. s.w. of Calais, 139 m. n.n.w. of Paris; lat. 50° 45' n., long. 1° 36' e. The town consists of two parts—Upper and Lower Boulogne. The upper town was, in former times, strongly fortified; but its citadel was demolished, 1690, and its ramparts have been converted into beautiful promenades, with fine views, from which, in clear weather, the spire of Dover, Eng., can be seen. The upper town contains the Hôtel-de-Ville, and the Cathedral, a modern edifice with a conspicuous dome. The lower town, properly the seaport, is newer, finer, more populous, and more lively, inhabited chiefly by merchants, mariners, and fishermen. It contains the barracks, the great hospital, the theatre, the museum, and gallery of art. The streets have been much improved by side-pavement, and many new and elegant buildings have been erected. A large wet-dock was completed 1872. B. has numerous churches and

BOULT—BOULTER.

educational institutions; is the seat of various associations; has extensive and excellent salt-water baths; and, on account of its fine sands, is much resorted to for sea-bathing. The people are actively engaged in the boiling of sugar, in the manufacture of linen and sail-cloth, cordage, etc., and in fishing, the coast being productive in oysters, herring, cod, and mackerel. B. has an active coasting trade, and ranks with Calais as one of the nearest and most frequented places of passage between France and England, steamers plying daily to London, which they reach in from 9 to 10 hours, and twice a day to Folkestone, which they reach in about two hours. B. is much resorted to by the English, who form a large section of the population, and for whose accommodation there are numerous hotels and boarding-houses. Paris is reached by railway from B. in $4\frac{1}{2}$ hours. The harbor of B. is too shallow for great ships of war, which can reach only the wide and safe roads of St. Jean; it has been, however, repeatedly enlarged and improved, so as to admit large merchant vessels at high water. A new and extensive deep-sea harbor was begun 1879. The long pier forms a fine promenade. B. was anciently called *Gessoriacum*, in the country of the Morini; after the time of Constantine the Great, it was called *Bmonia*, and after that of the Carolingians, *Bolonia*. In 1435, B. came into the possession of the Duke of Burgundy and was united with the crown of France by Louis XI., 1477. B. was besieged by Henry VII. of England, 1492, taken by Henry VIII., 1544, and restored to the French by Edward VI., 1550. B. was selected by Napoleon as the starting point for the invasion of England, and here he encamped 180,000 men and collected 2,400 transports, ready at any favorable moment to swoop down on the shores of Britain; but, after months' watching, the war with Austria created other employment for them. As a memorial of this great camp a tall marble column was commenced on the higher grounds, but being incomplete at the restoration of the Bourbons it was finished and inaugurated in honor of Louis XVIII. It has since been restored to its original object and surmounted by a colossal statue of Napoleon. The poets Campbell and Churchill died at B., and the house, or rather the house occupying the site of that in which Le Sage, author of *Gil Blas*, is said to have died, is shown to the visitor. Altogether, B. is a thriving and agreeable place of residence, and from its accessibility to English tourists and rapid railway transit to Paris it has greatly superseded Calais as a place of debarkation. Pop. (1881) 44,842; (1891) 45,205; (1901) 49,949.

BOULT, v.: see BOLT 2.

BOULTER, *bōl'tēr*, HUGH, Archbishop of Armagh, Primate of Ireland: 1671-1742. This English prelate, accompanied George I. into Hanover as chaplain, and was afterward Bp. of Bristol and Dean of Christ Church, Oxford. Ireland, to which he went as primate and chief justice, was suffering with all the evils of civil discord; and the

BOULTON—BOUND.

new archbishop applied himself to their mitigation with a zeal and charity that knew no bounds. In the famine of 1740 he fed, at his own expense, thousands of poor people daily. He spent \$150,000 in assisting poor clergymen and in establishing schools and hospitals, etc. Although very learned his writings that remain are only *Sermons* and *Pastoral Letters* (Oxford, 1769, 2 vols.).

BOULTON, *bōl'tun*, MATTHEW: English mechanician. 1728–1809, Aug. 17; b. Birmingham, where his father, a steel manufacturer, had acquired wealth. When still very young he undertook, at his father's death, the business of the manufactory, which he carried on with great energy, and extended, 1762, by the purchase of a piece of land, then a barren heath, at Soho, near his native town. One of his first inventions was a new mode of inlaying steel. He entered into partnership with James Watt (q.v.), who had obtained a patent for the great improvements in the steam-engine which have immortalized his name, and they established a manufactory of steam-engines 1769. They jointly contributed also to the improvement of coining machinery, and so to the perfection of the coinage itself. B. was extremely amiable and generous.

BOUNCE, *n.* *bowns* [Dut. *bonzen*, to knock—from *bons*, a blow: Gael. *bonnsaig*, to leap; to bounce—from *bonn*, a heel, a basis]: the rebound of a heavy blow or thump; a sudden fall; a loud sound; an untruthful boast: **V.** to leap, rush, or spring out suddenly; to boast boldly; to lie. **BOUN'CING**, *imp.*: **ADJ.** large; heavy; stout and active. **BOUNCED**, *pp.* *bownst*. **BOUN'CER**, *n.* *-sēr*, a bold boaster; a liar; a falsehood; a lie. **BOUN'CINGLY**, *ad.* *-lī*.

BOUND, *bownd*: **pt.** and **pp.** of **BIND**, which see; confined or restrained—as *wind-bound*, *ice-bound*; obliged by moral ties.

BOUND, *a.* *bownd* [Icel. *búinn*, prepared, ready—from *búa*, to prepare, to set out]: going, or ready to go to; destined; bent toward a place.

BOUND, *n.* *bownd* [F. *borne*; OF. *bonne*, a limit—from mid. L. *bodina*, a limit or march]: a limit: **V.** to limit; to restrain or confine. **BOUND'ING**, *imp.* **BOUND'ED**, *pp.* **BOUND'LESS**, *a.* without limits. **BOUND'LESSLY**, *ad.* *-lī*. **BOUND'LESSNESS**, *n.* the quality of being without bounds or limits. **BOUNDARY**, *n.* *bownd'ēr-ī*, the bounds, or what marks the bounds; the tangible or visible mark which indicates the bounds: see **PARISH**: **BEATING THE BOUNDS**. *Bound*, or *Boundary*, is the utmost limits of land by which the same is known and can be described; being in *this* sense synonymous with *abuttals*. The *sides* of the land are properly said to be *adjoining*, and the ends *abutting* to the thing contiguous.—**SYN.** of 'boundary': border; frontier; confines; precincts; limit; purlieu; termination; barrier; verge; —of 'boundless': unbounded; unlimited; infinite; unconfined; unmeasurable; illimitable; unrestricted.

BOUND, *v.* *bownd* [F. *bondir*, to resound or re-echo, as by leaps, then to bound or leap—from mid. L. *bombitārē*,

BOUND BROOK—BOUNTY.

to resound—*lit.*, to resound or re-echo]: to rebound; to spring or leap; to move forward by leaps or jumps: N. a leap; a spring; a rebound. BOUND'ING, imp.: ADJ. springing or moving forward by leaps: N. the starting or springing out or upward. BOUND'ED, pp. BOUNDING-STONE, a stone to play with.

BOUND BROOK: borough in Bridgewater tp., Somerset Co., N. J.; 31 m. s.w. of New York; on the Raritan river and the Delaware and Raritan canal. It is a pleasant village, noted as a railroad junction, and for an extensive lumber trade. During the revolution it was one of the places of winter encampment for Washington's army. Pop. (1900) 2,622.

BOUNDEN, a. *bound'dēn* [from BIND]: morally imperative; obligatory.

BOUNTIHEAD, n. *bound'tī-hēd* [F. *bonté*, goodness: AS. *had*, person, head, state, condition]: in *OE.*, goodness; virtue: also BOUNTIHOOD, n. same sense.

BOUNTY, n. *bound'tī* [F. *bonté*, goodness—from L. *bonitatem*—from *bōnus*, good: It. *bonitate*]: liberality in giving; kind favors; anything given over and above what is due; a premium. BOUNTEOUS, a. *bound'tī-ūs*, liberal and generous; very kind in bestowing favors. BOUN'TEOUSLY, ad. *-lī*. BOUN'TEOUSNESS, n. BOUNTIFUL, a. *bound'tī-fūl*, liberal in bestowing gifts and favors. BOUN'TIFULLY, ad. *-lī*. BOUN'TIFULNESS, n. liberality in the bestowal of gifts and favors.—SYN. of 'bounty': generosity; munificence; kindness; liberality; beneficence; bountifulness; benevolence.

BOUNTY: a term applied to any sum granted by the legislature toward creating or encouraging some kind of undertaking believed to be of national importance. At one time, in Britain, there was no end to the giving of bounties in this way from the public purse—there were bounties on exporting corn, with a view to encouraging agriculture; bounties on the tonnage of vessels employed in the herring and whale fisheries; on the importation of materials of manufactures; on the importation of indigo from the colonies; on the exportation of Irish linen, etc. The fallacy of carrying to such a costly extreme this factitious process for fostering commerce, manufactures, and agriculture was amply demonstrated by Adam Smith in his *Wealth of Nations*, one of his more striking facts being that every barrel of herrings which sold for 20s. would cost the government about 25s. The theory that bounties may properly be given to a limited extent and with caution, as an encouragement in the infancy of undertakings, is advocated by some economists and vehemently denounced by others. The latter assert that, beside taxing the general community in order to reward or encourage individuals, bounties do no real good to the parties so favored; for by such inducements they engage in businesses for which they have no special vocation, or which, in existing circumstances, it would be preferable to let alone; thus bounties are held to share in the condemna-

BOUNTY—BOUQUETIN.

tion due to all measures alleged to be for the special protection of any trade or business. The subsidies in the form of extra rates paid to certain steamboat companies for carrying the mails may be said to be the last remnant of British bounties. The carrying of the mails, as involving greater responsibilities than ordinary goods, is paid at much higher rates, even where the ordinary traffic is remunerative, as on the Atlantic route, which is crossed by the greatest number of steamboat lines. These contracts have been objected to in the house of commons as monopolies. But on the other hand—in favor of a cautious and limited bounty for a transitorial period, in selected cases, with a view to all the facts that bear on the public interest in each case—it is argued that no sweeping generalization can foreclose the case where interests so complex are involved; that a *doctrinaire* theory should be brought to the test of experience before it is established as authority beyond appeal; that former abuses or even some present risks in the line of a certain practice are not a final argument against it. The question has become a practical one in the United States, since 1890-1: see SUBSIDY.—The McKinley act of 1890 grants a B. to the producers of all kinds of sugars produced in the United States.—See FREE TRADE: TARIFF: CUSTOMS DUTIES: ETC.

BOUNTY, in the Army or Navy: a sum of money given to encourage men to enter the service. In time of peace, the B. sinks to a minimum; but in cases of exigency it is raised. In the United States, B. is a term for grants of land to soldiers and sailors, their widows and children, on account of service in the army and navy. Also the money paid to the 'substitutes' of drafted men is called a Bounty.—See ENLISTMENT: RECRUITING: PRIZE: SALVAGE: BOOTY.

BOUNTY, MUTINY OF THE: See PITCAIRN ISLAND.

BOUQUET, n. *bó-kā'* [F. *bouquet*—from OF. *bosquet*, a little wood—from OF. *bos*; F. *bois*, a wood]: a bunch of flowers; a nosegay; the peculiar scent or odor characteristic of each variety of the better class of wines, due principally to the presence of ænanthic ether: see WINE.

BOUQUETIN, *bó'-kēt-ín*, or IBEX of the Alps (*Capra Ibex*): species of goat which inhabits the highest regions of the Alps, even higher and wilder than those inhabited by the chamois, up to the limits of perpetual snow. It is the *Ibex* of the ancients: see IBEX. In German Switzerland its name is *Steinbock*. It was at one time found on all the higher Alps, but has disappeared from most of them and exists chiefly on those between the Valais and Piedmont, where it is carefully protected by the Italian government. It is larger and more powerful than the common goat and has a small head and great horns (those of the male $1\frac{1}{2}$ –2 ft. long), which curve backward, are directed a little outward, and have prominent transverse knots or bands on the front. The horns of the females are only about six inches long. The hoofs are large, rough on the sole, and capable of being spread widely apart, to give greater security of footing. The general color is brown. The body

BOUQUETIN.

is covered with two kinds of hair, the longer hair being mixed, at least in winter, with thick, soft wool. There is no beard, except a few hairs in winter, although the animal has been often incorrectly figured as having one.

The B. feeds on the herbage and small shrubs found on the last confines of vegetation, and descends by night to browse in the highest forests, the lichens and branches of which supply much of its winter food. It is capable of



Bouquetin.

enduring great cold and will remain, with seeming indifference, for hours on the summit of a rock, motionless, during the most severe storm. It possesses an extraordinary power of bounding from crag to crag, and of ascending or descending almost perpendicular precipices. Even the projections of a wall of rough masonry have been seen to suffice for the feet of a tame one to take hold of. One has also been known frequently to spring from the ground, without a race, and plant itself on a man's head. Tschudi rejects as a fable the statement which has been repeated by one naturalist after another, from the days of Gesner, that the B. throws itself down precipices, so as to fall upon its horns, their elasticity preserving it from injury.

When taken young the B. is easily tamed. It readily associates with common goats and breeds with them, and the hybrids produce young, of which, however, it does not appear that in any case both parents have been ascertained to be hybrids.

It has been suggested that this animal might be made useful to the inhabitants of such countries as Iceland and Greenland.

BOURBON.

BOURBON, *bór'bun*, Fr. *bór-bōng'*: a French family of the highest note in history, and which came to possess several European thrones, deriving its name from the castle and seignory of Bourbon, in the former province of Bourbonnais, in the centre of France. The first lord or *sire* of this family of whom history makes mention was Adhémar, at the beginning of the 10th c. The fourth in succession from him, Archambauld I., added the name of the family castle to his own. Under his successors, who also bore the name of Archambauld, the family possessions were soon very much increased. At length the seignory of Bourbon, having devolved upon an heiress, who in 1272, married Robert, the sixth son of Louis IX. of France, thus passed to a branch of the royal family of the Capets, under whom it was converted into a duchy. The principal branch of this family was deprived, 1523, of all its dignities and possessions, because the duke, Charles de B. (q.v.), the famous Constable, allied himself with Charles V. against Francis I. of France.

Of the collateral branches, that of Vendôme acquired great importance, first attaining by marriage, in the person of Antoine de B., Duke of Vendôme, to the throne of Navarre; afterward by inheritance to the throne of France, in the person of Henry IV., on the extinction of the male line of the House of Valois, and by the fortune of war to the thrones of Spain and Naples. Among the numerous other collateral branches may be mentioned those of Montpensier, De la Marche, Condé, Conti, Soissons, and Orleans. Only a few members of the collateral lines, however, have borne the name of B.; for example, the Cardinal Charles de B., Duke of Vendôme, who under the name of Charles X., was set up by the Catholic League as a rival king to Henry IV. The ducal dignity was revived by Louis XIV. in the House of Condé, so that the eldest son of that house should bear the title of Duke of Bourbon.

The dynasty of the Bourbons in France begins with Henry IV. (q.v.), who, after the assassination of Henry III., became, in virtue of the Salic Law (q.v.), the next heir to the French throne. Through his father Antoine de B., King of Navarre and Duke of Vendôme, he was descended from Robert, son of Louis IX., and husband of Beatrix, heiress of Bourbon. On his assassination, 1610, he left by his second wife, Mary de' Medici, five legitimate children; 1. Louis XIII. (q.v.), his successor on the throne; 2. J. B. Gaston, Duke of Orleans (q.v.), who died 1660, and left no male heirs; 3. Elizabeth, married to Philip IV. of Spain; 4. Christina, married to Victor Amadeus, afterward Duke of Savoy; 5. Henrietta, married to Charles I. of England.—Louis XIII., on his death, 1643, left two sons by his queen, Anne of Austria: 1. Louis XIV. (q.v.), his successor; and, 2., Philip, who received from his elder brother the title of Duke of Orleans, and was the founder of the family which has become the younger B. dynasty.—The Dauphin Louis, styled Monsieur, son of Louis XIV., by his marriage with Maria Theresa of Austria, died 1711, Apr. 14, and left three sons by his marriage with Maria

Anna of Bavaria: 1. Louis, Duke of Burgundy (q.v.); 2. Philip, Duke of Anjou, who afterward became king of Spain, as Philip V.; 3. Charles, Duke of Berri, who died 1714.—Louis, Duke of Burgundy, died 1712. By his wife, Maria Adelaide of Savoy, he had three sons, of whom two died in early youth, the only one who survived being Louis XV., who succeeded his great grandfather, Louis XIV., 1715.—Louis XV. having married Maria Leszcynska, daughter of the dethroned king Stanislaus of Poland, had by her a son, the Dauphin Louis, who married Maria Josepha of Saxony, and died 1765, leaving three sons: 1. Louis XVI. (q.v.), who succeeded his grandfather, Louis XV., 1774; 2. Louis Stanislaus Xavier, Count of Provence, afterward Louis XVIII.; 3. Charles Philippe, Count of Artois, afterward Charles X.—Louis XVI. had three children by his queen, Marie Antoinette of Austria: 1. The Dauphin Louis, who died 1789; 2. Louis, called Louis XVII. (q.v.), who died 1795; 3. Marie Therese Charlotte, styled Madame Royale, afterward Duchesse d'Angoulême (q.v.).—Louis XVIII. had no children, but Charles X. had two sons: 1. Louis Antoine de B., Duke of Angoulême (q.v.), who was dauphin prior to the Revolution of 1830, and died without issue 1844; 2. Charles Ferdinand, Duke of Berri (q.v.), who was murdered 1820. The Duke of Berri left two children: 1. Marie Louise Therese, styled Mademoiselle d'Artois, married to the duke of Parma; 2. Henry Charles Ferdinand Marie Dieudonné, Duke of Bordeaux, styled Count de Chambord (q.v.); he died childless 1883, when the Legitimists of France accepted in his room the Orleanist Duc de Paris as head of the house of Bourbon.

It has already been stated that the founder of the Orleans, or younger branch of the B. royal family of France, was Philip, Duke of Orleans (q.v.), the younger brother of Louis XIV. He died 1701, leaving, by his second marriage with Elizabeth Charlotte of the Palatinate, a son of his own name as his heir, who was Regent of France during the minority of Louis XV. His son Louis Philippe, Duke of Orleans (b. 1703), married a princess of Baden, and died 1752, leaving an only son of his own name (b. 1725, d. 1785), whose son and heir was that Louis Joseph Philippe, Duke of Orleans (q.v.), so notable in the French Revolution, who, 1792, renounced his rank, taking the name of Citizen Egalité, and died by the guillotine 1793. He left four children: 1. Louis Philippe (q.v.), who, before the Revolution, was styled Duke of Chartres—that being the ordinary title of the eldest son of the Orleans family—became afterward Duke of Orleans, was King of the French 1830–48, and died in England 1850, Aug. 26; 2. The Duke de Montpensier, who died in England 1807; 3. the Count de Beaujolais, who died at Malta 1808; 4. Adelaide, styled Mademoiselle d'Orleans, b. 1777, d. 1847.—Louis Philippe left a numerous family by his queen, Amelia of Naples, but his eldest son, Ferdinand, Duke of Orleans, lost his life by an accident 1842, July 13, leaving by his wife, the Princess Heien of Mecklenburg-Schwerin,

two sons, the eldest of whom, Louis Philippe Albert, now styled Count of Paris, is the representative of the younger or Orleans B. family. Concerning the other members of Louis Philippe's family, see LOUIS PHILIPPE.

Louis XIV., having succeeded in placing his grandson, Philippe, Duke of Anjou, on the throne of Spain in 1700 as Philip V., this prince became the founder of the Spanish B. dynasty, as well as of the B. dynasties of Naples, Parma, and Piacenza. These dynasties endured only a temporary overthrow from the policy and arms of Napoleon Bonaparte. Philip V. was succeeded on the Spanish throne by his son, Ferdinand VI., who died without issue 1759, and the crown fell to his brother, Charles III., whose son and successor, Charles IV., was compelled to resign it, 1808, in favor of a successor nominated by Napoleon, and died at Rome 1811. The two eldest sons of Charles IV. by his marriage with Maria Louisa of Parma were—1. Don Fernando, Prince of Asturias, who, after the overthrow of Napoleon, reigned as Ferdinand VII. (q.v.), whose eldest daughter was Isabella II., the mother of Alfonso XII.; 2. Don Carlos (q.v.), who, on the death of his elder brother in 1833, became pretender to the Spanish throne until 1845, when he resigned his pretensions in favor of his son, Count de Montemolin. Don Carlos died at Trieste 1855. The Count de Montemolin died 1861, and his claims to the Spanish throne are now represented by his nephew, Don Carlos, son of his brother Juan.

Philip V. did not succeed in keeping possession of the crown of the Two Sicilies (see NAPLES) as of that of Spain, the House of Hapsburg being restored there in the person of a son of Leopold I., who in 1720 ascended the throne as Charles III. But in consequence of the peace of Vienna, the son of Philip V. became king of the Two Sicilies, likewise by the name of Charles III. Upon his accession to the throne of Spain, 1759, he gave up that of Sicily to his third son, Don Fernando, called Ferdinand IV., with the express stipulation that it should never again be occupied by a king of Spain. Ferdinand IV. was compelled to yield to the French arms, 1806, but after the overthrow of Napoleon he became king of the Two Sicilies as Ferdinand I. (q.v.). His son, Francis I., left the throne in 1830 to his son Ferdinand II. (q.v.), whose son, Francis II., was expelled, 1860, when Naples was incorporated with the new kingdom of Italy.

By the peace of Aix-la-Chapelle, 1748, Austria made over the duchies of Parma and Piacenza to Don Philip, youngest son of Philip V. of Spain, but with stipulation of their reversion to Austria on the failure of his male descendants, or on his succeeding to the throne of Spain. He was succeeded 1765 by his son, Ferdinand I., whose son, the hereditary Prince Charles Louis Ferdinand, was made king of Etruria, 1801, under the guardianship of his mother, Maria Louisa of Spain; but Etruria, being soon incorporated with France, they were completely dispossessed. The Congress of Vienna assigned Parma and Piacenza for life to Maria Louisa of Austria, the spouse of Napoleon, but meanwhile

BOURBON.

indemnified Maria Louisa of Spain with the duchy of Lucca. In 1847, Parma and Piacenza reverted to the B. family in the person of the former king of Etruria, Charles Louis de B., who had succeeded his mother in Lucca, 1824. He abdicated, 1849, Mar. 14, and was succeeded as Duke of Parma and Piacenza by his son, Charles III., and he in 1854 by his son Robert (b. 1848), whose mother, Maria Louisa Theresa de B., daughter of the Duke of Berri, then became regent of the duchies. The B. family lost these duchies, 1859. See ITALY and PARMA: see also Coiffier-Demoret, *Histoire du Bourbonnais* (1828); Achaintre, *Histoire Chronologique et Généalogique de la Maison Royale de Bourbon* (1825); also histories by Mure (Par. 1860-68) and Dussieux (1869).

BOURBON, *bôr-bông'*, CHARLES, Duke DU BOURBONNAIS, styled CONSTABLE DE BOURBON: 1489-1527, May 6; son of the Count of Montpensier; and in consequence of the death of his elder brother and his marriage with the only daughter of the Duke of Bourbon, he united in his own possession the vast estates of both these branches of the Bourbon family. Holding a very high position in virtue of his birth and wealth, he soon showed himself to be no ordinary character, by the brilliancy of his exploits in arms and by his rigid morals and severe, taciturn disposition. At the age of 26 he received from Francis I. the Constable's sword, and was sent to Italy at the head of an army, which he disciplined on the march, and, crossing the Alps by passes previously deemed impracticable, he surprised the hostile generals, won the battle of Marignan (1515), and within a few days placed the keys of the citadel of Milan in the king's hand, acquiring for himself by these exploits the reputation of the greatest general of his time. But Maria Louisa, the king's mother, became enamored of the brave Constable, and he, although a widower, declined her hand, openly declaring that he deemed her a woman devoid of modesty and not to be thought of for a wife. Her revenge led to the seizure, on behalf of the crown, of the estates which he had acquired through his wife and the withholding of his pay as Constable. Thus deeply injured he renounced the interest of France, and concluded a private alliance with the emperor Charles V. and with Henry VIII. of England. The former agreed to give him in marriage his sister, Eleonora, who had Portugal as her jointure, and to make an independent kingdom for him of Provence and Dauphiné, with his own possessions of the Bourbonnais and Auvergne. The rest of France was to be apportioned between the two confederates. The king, who was engaged in an expedition to Italy, received intelligence of this conspiracy. Forthwith he proceeded in person to the Constable and offered him restoration to favor and also of his estates. The Constable, however, did not trust him, but fled in disguise and reached Franche Comté in 1523. In order not to appear as a fugitive to the Spanish army, which awaited him in Lombardy, he drew around him 6,000 German lancers and soon contrived to gain their entire attachment. He attacked, 1524, the

French army on its march over the Alps, and thought to have advanced to the heart of France with the Spaniards, whose general he had been appointed by the emperor. But Charles V. did not entirely trust him and appointed the Marquis of Pescara to assist and watch him. He was compelled to relinquish the siege of Marseille on the approach of Francis I. with a great army. He repassed the Alps and took his revenge in the battle of Pavia, 1525, Feb. 24, where the king was made a prisoner. He now went to Madrid, but soon found himself entirely disappointed in his hopes and was sent back to Lombardy by Charles V. Without money or support, surrounded by daring and mutinous bands, he conceived a plan to found for himself an independent dominion and to unite himself with France against Spain. Hastily gathering together the wild bands around Milan he led them against Rome; and, 1527, May 6, unprovided with things necessary for a siege, appeared before the walls of that city. Resolved to conquer or die, he led up his troops in the most impetuous manner and eagerly seized with his own hands a scaling-ladder, in order to make his way over a weak place of the walls, when he was mortally wounded by a bullet, which Benvenuto Cellini afterward asserted that he had shot. His death was kept secret for a time from the storming army under his command. When it departed from Rome, two months later, his corpse, which the soldiers would not part with, was taken with them and buried at Gaeta under a magnificent monument, which, however, was afterward destroyed.

BOURBON, ILE DE, *əl dēh bōr-bōng'*, or, as it is called at present, RÉUNION, *ra-ūn-ōng'*: island in the Indian Ocean, the southernmost of the Mascarene Isles, about 100 m. s. w. from Mauritius, 360 m. e. from Madagascar. It is one of the most important of the insular colonies of France. It is about 38 m. in length, and 28 in greatest breadth; abt. 970 sq. m. It may be described as one great mountain mass, of which the highest peaks are the Piton de Neiges—in the centre of the island, rising more than 10,000 ft. above the sea—the Grand Bernard, and the Cimandef, in the n., with respective heights of 9,500 and 7,300 ft.; and in the s. e., the Piton de Fournaise, 7,200 ft. high, one of the greatest volcanoes in the world, and one of the most active, its eruptions taking place at least twice every year, and its lava-streams sometimes reaching to the sea. This volcano occupies, perhaps, one sixth of the island, often changes its crater, and is surrounded by a district of more than 10,000 acres, which is a dreary desert and is called the *Pays Brûlé* (Burned Land). Except in this part, however, the soil is in general extremely fruitful. About a fourth part of the island is cultivated, chiefly along the coast, although much of the interior is of great natural fertility. The scenery is very beautiful. Streams, although not large, are very numerous, and rush in cascades to the sea. The climate, formerly mild and salubrious, is now very unhealthful to Europeans, who cannot reside four or five years on the island without an attack of typhoid fever or dysentery. The s. e. mon-

soon and hurricanes often make fearful devastation. The plants of Arabia, of the Asiatic archipelago, and of the s. of Europe, thrive equally well here; coffee and cloves are produced, with the fruits of Italy and Spain. The trade is estimated at about \$10,000,000. By far the most important article of export is sugar; coffee, vanilla, cloves, saltpetre, wood for cabinet-making, and dye-woods, are the other exports. The value of the exports, which up to 1867 had been steadily increasing, has since then greatly declined, as the crops have repeatedly suffered from cyclones, persistent drought, and blight. The cereals grown in the island are not sufficient for its own wants. Cattle are imported from Madagascar. The capital of the island, and seat of government, is St. Denis, on the n.w. coast, with 9,000 inhabitants, a college, a botanic garden, etc.; lat. 20° 52' s., long. 55° 30' e. The mean temperature here is 77° F. There is an almost total want of harbors, the whole coast of the island possessing only two tolerable anchoring-places—one at St. Denis and another at St. Paul, 18 m. farther s. But France is now constructing at fabulous cost a new and great harbor, meant to be an eastern Cherbourg. B. and Mauritius were discovered by the Portuguese navigator, Mascarenhas, and named after him the Mascarene Isles. After the French had begun their attempt to found a colony in Madagascar they took possession of B., 1649, giving it that name, which was changed to Isle de la Réunion at the Revolution, and to Isle de Bonaparte 1809. The name has been varied according to the political changes in France, after the treaty of Paris, 1814, re-assuming the name Isle de Bourbon; and since 1848 called again Isle de la Réunion, by which it is now officially known. The French having in 1720 taken possession of Mauritius, which they named Isle of France, the Mascarene Isles were placed under one governor. In 1810 they were taken by the British, but B. was restored to France 1814. Pop. of Isle de Bourbon (1881) 172,084, including some hundreds of Chinese, 6,000 negroes, 34,500 East Indians, and a garrison and other officials to the number of abt. 2,000; (1891) 165,009.

BOURBONNAIS, *bôr-bon-nā'*: gently undulating, terrace-formed district in the centre of France, n. of the high lands of Auvergne, abounding in grain, fruits, wine, iron, marble, and mineral springs. From 1327–1523 it formed the duchy of Bourbon, and afterward, becoming a domain of the crown, it formed a separate province of France. It now constitutes the dept. of Allier, and part of the dept. of Cher. The capital was Moulins.

BOURBONNE-LES-BAINS, *bôr-bonn'lä-băng*: town of France, dept. of Haute-Marne, abt. 20 m. e.n.e. of Langres; pleasantly situated at the confluence of the Borne and the Aspance. It has some fine promenades and manufactures of cotton, hosiery, and cutlery. Its chief feature is its saline springs, which range in temperature from 121°–136° F., and are much resorted to by people suffering from chronic complaints or old wounds. Pop. (1891) 4,322.

BOURBON- VENDÉE: see NAPOLEON VENDÉE.

BOURD—BOURDON.

BOURD, n. *bórd* [F. *bourde*, a lie, a sham, a jest: Bret. *bourd*, deceit: Gael. *burd*, mockery]: in *Œ.*, the act of making fun of one by deceiving him; a jest; sport: V. to jest. **BOURD'ING**, imp. **BOURD'ED**, pp.

BOURDALOUE, *bór-dá-ló'*, LOUIS: 1632, Aug 20—1704, May 13; b. Bourges: one of the greatest pulpit orators of France. Having, at the age of 16, entered into the order of the Jesuits he obtained in succession the chairs of humanity, rhetoric, philosophy, and theological ethics in the acad. of his native place. He showed great capacity for science, but his remarkable eloquence led his superiors finally to determine upon employing him as a preacher. Disdaining the inflated style prevalent among the tasteless pulpit orators of his time, he assailed with manly vigor and truly religious earnestness the passions, weaknesses, and errors of men. The dignity of his manner and the fire of his eloquence made him famous, even when the public mind was occupied with the festivities of Versailles, the victories of Turenne, and the literary masterpieces of Corneille and Racine. At the court of Louis XIV. he was remarkably well received. After the revocation of the Edict of Nantes, he was sent to Montpellier, 1686, to labor among the Protestants on behalf of the Rom. Cath. Church. B. particularly understood how to accommodate his eloquence to the minds of those whom he addressed. Simple among the simple, a dialectician among ecclesiastics, he was equally a favorite with the common people and with the learned and the great. He was also much esteemed and beloved as a man, and in all circumstances maintained unimpeached a high reputation for candor and honesty. In the later years of his life he relinquished the pulpit and devoted his time to hospitals, prisons, and pious institutions. He died at Paris. How thoroughly his religious sentiments were governed by the theological tenets of his church may be perceived from these remarkable words which he uttered on his death-bed: 'It is highly reasonable that God be fully satisfied, and at least in purgatory I will suffer with patience and with love.' Several editions have appeared of the collected works of B. (as 16 vols., Versailles, 1812, and most recently in the *Panthéon Littéraire*, 3 vols., Par. 1838). The best edition of his sermons is that published under the care of Bretonneau (16 vols., and 18 vols., Par. 1707-34). His life was written by Madame de Pringy.

BOURDEILLES: see **BRANTÔME**.

BOURDON, n. *bór'dōng* [F. *burdon*, a pilgrim's staff—from mid. L. *burdo*, an ass: It. *bordone*, a staff, a prop]: the tall walking-staff used by pilgrims in the middle ages.

BOURDON, n. *bór'dōng* [F. *bourdon*, the drone stop of an organ, the drone of a dor-bee, etc.: Sp. *bordon*, the bass of an organ: Gael. *burdan*, a humming noise]: the drone of a bagpipe; an organ-stop of stopped wooden pipes, usually 8 ft. pipes giving a 16 ft. tone. In the pedal organ it is useful as a soft foundation stop; on'the manual it is a 'double' stop. Also, a musical accompaniment: see **BURDEN 2**.

BOURDON—BOURGELAT.

BOURDON, *bór-dōng'*, **LOUIS PIERRE MARIE**: 1799-1854; b. Alençon: French mathematician. He took a course at the polytechnic school, became inspector of studies and member of the council of the univ. 1835. B. was not a man of genius but has a place among those who have popularized science. He published the following works, which are still classical: *Éléments d'algèbre* (1817) adopted by Prof. Davies of West Point, and widely known in this country; *Éléments d'arithmétique* (1821); *Application de l'algèbre à la géométrie* (1824); *Trigonométrie rectiligne et sphérique* (1854).

BOURDON DE L'OISE, *bór-dōng' deh loáz*, **FRANÇOIS LOUIS**: b. St. Remy, near Compiègne, middle of 18th c.; d. 1797 or '98: notorious character of the French Revolution. He became a procurator in the parliament of Paris. He helped to storm the Tuileries, 1792, Aug. 10. He shortly afterward obtained a seat in the Convention by a trick, presenting himself as the regularly elected deputy for the dept. of Oise, in which he had actually been defeated by a namesake who was elected also for that of Loiret. The trick was subsequently discovered but he was not ejected. B. contributed much to bring about the execution of Louis XVI., the insurrection of May 31, and the destruction of the Girondists. He was sent to La Vendée, where, however, he loudly condemned the revolutionary cruelties, and appeared in the character of a moderate. Obnoxious on this account to Robespierre and Hébert, and fearing for his head, he urged on with the greatest eagerness the overthrow of the Terrorists on the 9th Thermidor (1794, July 27). From this time B. showed himself an enemy of the clubs, and a protector of the nobles and the priests. In consequence of the insurrection of 13th Vendémiaire (1795, Oct. 5), he was sent as commissioner to Chartres, where he behaved brutally. He passed from the Convention into the Council of Five Hundred, became a persecutor of the republicans, and joined a royalist club. The directory placed him upon the proscription list after the 18th Fructidor (1797, Sep. 4). He was transported to Cayenne, where, in a short time, he died in great misery, tortured with remorse.

BOURG, n. *bórg* [*F. bourg*, burgh, a market-town]: a town or village; a municipality.

BOURGELAT, *bórzh-lá'*, **CLAUDE**: 1712-99; b. Lyon, France: founder of the first veterinary school and institutor of a distinct profession of veterinary surgeons. He was a learned lawyer, an able writer, and the bosom friend of D'Alembert. In his project to educate men for a scientific treatment of the ills of horses and other domestic animals, he found a friend and collaborator in a minister of Lyon, Bertin, and in 1761 the first veterinary school was opened in the suburbs of the city. It was patronized by royalty and students flocked to it from France, Italy, Switzerland, Germany, Sweden, and Denmark. From it all other veterinary colleges in Europe sprang, and it has kept pace with them—superior to the majority, and rivalling the very best, even those of Paris and Berlin.

BOURG-EN-BRESSE—BOURGES.

B. wrote much, and his works on Farriery, *Materia Medica*, External Form, Contagious Diseases, and on the various apparatus and bandages used for quadrupeds, are still highly esteemed.

BOURG-EN-BRESSE, *bôrg-ông-brës'*: town of France, capital of the dept. of Ain, pleasantly situated on the left bank of the Reyssouze, about 20 m. e.s.e of Mâcon. It is well built, has several public fountains, a statue to Bichat, the celebrated anatomist, who was a student at the hospital here, a museum, a fine corn-market, and a public library of 19,000 vols. The distinguished astronomer, Lalande, was a native of B. It has manufactures of linen, cotton, hosiery, and leather, and a trade in agricultural produce. The town was captured by the allies, 1814. Pop. (1891) 18,113.

BOURGEOIS, n. *bôrzh-waw'* [F. a burgher—from *bourg*, a market-town]: in France, one of the middle order of inhabitants in towns, as distinguished from the nobility and gentry. BOURGEOIS, n. *bër-joys'*, a kind of printing type in size between long primer and brevier: when it is set 'solid' nine lines fill a little more than an inch, and 1,000 *ems* of B. fill 13.86 sq. inches: see TYPE.

BOURGEOISIE, *bôrzh-waw'-zê*: French term, now frequently employed in English, German, and other languages, denoting a rank or class of society among the citizens of towns. It includes persons from the condition of heads of manufacturing or mercantile establishments down to master-tradesmen, and may be considered as a great middle class. The French B. have long been extremely hostile to the aristocracy, but have themselves latterly become the object of attack on the part of the operatives and of the extreme radical or red republican party. The term *bourgeois*, from which B. is formed, is quite distinct in meaning from *citoyen*, the latter term designating a citizen of the state.

BOURGEON, v. *bër'jôn* [F. *bourgeon*, the young bud or sprout of a vine: Norm. F. *bourgeonner*, to bud—from O. H. G. *burjan*, to lift, as the bud is the first out-push of a tree in spring]: to sprout; to put forth buds; to shoot into branches. BOURGEONING, imp. BOURGEONED, pp. *bër'jônd*.

BOURGES, *bôrzh*: capital of the dept. of Cher, France; in a fertile plain at the confluence of the Auron and the Yèvre, 144 m. s. of Paris. B. is divided into an old and new town, the latter built round the former. Its houses are of antique architecture, and its streets crooked and dirty. It was formerly surrounded by ramparts flanked with high towers, some of which remain; but the ramparts have been converted into promenades. B. has one of the noblest Gothic cathedrals in Europe, lighted by 59 splendid painted windows. Its university was suppressed at the Revolution. B. has greatly prospered since the railway has reached it. In 1861 it was chosen to be one of the military arsenals of France, and its strategical importance has become greater since the loss of Metz. B. is of great antiquity, being the *Avaricum* of the Gauls, in the country of the *Bituriges Cubi*. Taken by Cæsar, B.C. 52, it was afterward named *Bitu'rica*, and became cap. of the Roman

BOURGET—BOURIGNON.

province of *Aquitania Prima*. In the middle ages it was cap. of the province of Berri. Charles VII. had his residence at B., when almost all France had been taken from him by the English, and its Hôtel de Ville was originally the abode of his unfortunate minister, Jacques Cœur. Louis XI. was born at B. Of the seven ecclesiastical synods held at B., that of 1438—in which the Pragmatic Sanction of the Gallican Church was established with approbation of Charles VII., and the resolutions of the Council of Basel, relative to the papal power and the king's prerogatives, were confirmed—was the most important. Pop. (1891) 42,829; (1901) 46,551.

BOURGET, PAUL: eminent French critic and novelist: b. Amiens, France, 1852, Sep. 2———. He graduated with the highest honors from the college of Sainte-Barbe in 1872. His psychological essays (*Essais*, 1883–86) attracted much attention. His first novel, *L'Irréparable*, appeared in 1884; followed by *Cruelle Enigme* (1885); *Un Crime d'Amour* (1886); *André Cornelis* (1887); *Mensonge* (1887); *Le Disciple* (1889); *Cosmopolis* (1892); and *Outre-Mer* (1894). Admitted to the Academy 1894.

BOURIGNON, *bo-rèn-yōng'*, ANTOINETTE: 1616, Jan. 13—1680, Oct. 30; b. Lille, France; celebrated religious visionary. Her father was a merchant and she inherited from him a considerable patrimony. She was so ugly an infant that there was some thought of killing her as a monstrous birth. Her intellect, however, was very acute, and its powers were early developed, together with a tendency to religious mysticism, which was much encouraged by the reading of mystic books, till her imagination became inflamed and she fancied that she saw visions, conversed with God, and was called to restore the pure spirit of the gospel. She won over some nuns, became the head of a party, and travelled in various countries, gaining proselytes by her enthusiasm. At last she was appointed head of a hospital in East Friesland. She died at Franeker. According to Madame B., religion consists in internal emotion, not in either knowledge or practice. Her own character exhibited a strange combination of pride and avarice, with a sort of mystic piety. She never gave anything to the poor, alleging as a reason that she had consecrated all to God. Some of her pretended revelations were of the most indecent nature; many of them were extremely ridiculous; yet many persons of intelligence and learning believed in them and adopted the peculiar form of mysticism which soon began to receive the name of Bourignianism. Among the chief expounders of it was Peter Poiret, a Calvinistic minister. It spread to a remarkable extent both among Rom. Catholics and Protestants, and about the end of the 17th c., and beginning of the 18th, prevailed so much in Scotland that a solemn renunciation of it was demanded from every entrant on the ministry at his ordination. A minister of Aberdeen was deposed for it 1701. The formal renunciation of Bourignianism is still continued in the Established Church of Scotland, but has been given up as needless by other Presbyterian churches. The works of Madame B. were

BOURMONT—BOURNE.

edited by Poiret (25 vols., Amst. 1676–84; 2d edit. 1717). They exhibited not a little fiery eloquence.

BOURMONT, *bôr-mông'*, LOUIS AUGUSTE VICTOR DE GAISNE, Count DE: French marshal, conqueror of Algiers: 1773–1846, Oct.; b. at his paternal castle of Bourmont, in Anjou. He went into exile at the Revolution, served as an officer in the army of the Prince of Condé, and, 1793–96, was actively engaged in the anti-revolutionary struggle in La Vendée. Subsequently he obtained the favor of the first consul. Under the empire he was appointed to a colonelcy in the army of Naples and was soon raised to the rank of brig.-gen. In the campaigns of 1813,4, he distinguished himself upon a number of occasions, particularly in the battle of Dresden and by the defense of Nogent, on account of which Napoleon promoted him to the rank of gen. of division. In 1814, March 31, he declared for the Bourbons and received the command of a military division during the first Restoration; yet, on Napoleon's return, he went over to him and was intrusted with the command of a division of the army of the Moselle. On the evening before the battle of Ligny he deserted and betook himself to Louis XVIII., at Ghent. There can be no doubt that B. was singularly ungenerous in choosing such a moment to resign, nor is there anything in his career to indicate any high principle in what he did. His evidence went a considerable way in bringing about the condemnation and execution of Marshal Ney (q.v.). He received high military employment under Louis XVIII. Distinguishing himself in the chamber of peers as a zealous supporter of the king, he was appointed minister of war, 1829, and in this office showed great activity. When the expedition against Algiers was undertaken, 1830, Apr., he received the chief command of the troops, and the rapid success of the expedition was ascribed to his prudence and energy. For this he received the marshal's baton July 22; but on the Revolution taking place in that month, he was superseded in his command and went to England to share the exile of Charles X. Refusing to take the legal oath, he was struck off the lists of the French army and peerage 1832. In 1833 Dom Miguel of Portugal placed him at the head of his troops, but the campaign was brief and unsuccessful. B. finally settled on his estate in Anjou and died there.

BOURN, or BOURNE, n. *börn* [F. *borne*, a limit—from OF. *bonne*, bounds]: bounds; limits; confines; a goal.

BOURN, n. *börn* [AS. *burna*, a stream: Dut. *born*; Icel. *brunnr*; Goth. *brunna*, a spring, a fountain]: a small rivulet or water-course: see BURN.

BOURNE, *börn*, HUGH: 1772, April 3—1852, Oct. 11; b. Fordhays, Staffordshire, Eng.: founder of the sect of Primitive Methodists. Originally a preacher among the Wesleyan Methodists, he was distinguished by the fervor of his religious sentiments, and by his zeal for the conversion of the ungodly. His enthusiasm for 'revivals' and open-air meetings, however, received no countenance from

BOURNE—BOURRIENNE.

the leading clergymen of the denomination to which he belonged. In 1808, B. was cut off from the Wesleyan connection, strange to say, for following much the same course of earnest evangelization as Wesley himself had done. This did not daunt him. His preaching was wonderfully acceptable and he quickly gathered many devoted adherents. In 1810, Mar., a committee of 10 members was formed, which may be regarded as the first official organization of the body. In 1818, B. published in the *Primitive Methodist Magazine*, a narrative of his labors and of those of his coadjutors. In the course of his life he visited Scotland, Ireland, Canada, and the United States, where his ministrations were attended with great success. He died at Bemersley, in Staffordshire.

BOURNE, VINCENT: b. abt. the close of the 17th c.; d. 1747, Dec. 2: one of the most elegant Latin versifiers that England ever produced. In 1714, he entered Trinity College, Cambridge; in 1721, he took his degree of A.M., and subsequently he was appointed usher in Westminster School. It would be difficult to praise too highly B.'s exquisite contributions to Latin poetry. They bear comparison, not only in point of Latinity but also in point of originality, with the choicest productions of the ancient Roman poets. A gracefulness which pervades thought, sentiment, and expression, is their essential characteristic. The subject is, indeed, often insignificant, but the treatment is always perfect. His translations of English ballads and other lyrics into Latin are wonderfully felicitous, every beauty being retained with the most delicate skill, and every defect most carefully remedied. Cowper, Beattie, Charles Lamb, and others have expressed their admiration of B.'s singularly fine *genius*. The first edition of B.'s poems appeared 1734.

BOURNEMOUTH, *börn-mūth*: favorite English winter resort on Poole Bay, Hampshire, five m. w. of Christchurch. The climate is fine and the country around beautiful. There are establishments for consumptive patients, baths, a library, and an assembly-room. Pop. (1871) abt. 6,000; (1881) 18,600; (1891) 37,650.

BOURNONITE, n. *bór'nō-nīt* [after Count *Bournon*]: a mineral of a steel-gray color, a triple sulphate of antimony, lead, and copper—sulphur, 19.4; antimony, 26; lead, 41.8; copper, 12.8—known also as *endellionite*.

BOURNOUS': see BURNOOSE.

BOURRANS, n. *bór'ānz* [Russ. *borei*, the n. wind]: the name given to the fierce snow storms that blow from the north-east over the *steppes* of Russia.

BOURRIENNE, *bó-re-ě'n'*, LOUIS ANTOINE FAUVELET DE, sec. and early friend of Napoleon I.: 1769, July 9—1834, Feb. 7; b. Sens, France. He received his education in the military school at Brienne, where he formed the closest intimacy with the future emperor. He became, 1792, sec. to the embassy at Stuttgart. Deprived of this office by the breaking out of war, he lived for some

BOURSE—BOUSSA.

time a rather retired life, until, 1797, his former school-fellow appointed him his secretary. He accompanied him to Egypt and to Italy, and in 1801 was nominated a councillor of state. In 1802 he was dismissed from his office for being implicated in the dishonorable bankruptcy of the house of Coulon, army-contractors, but in 1805 he was appointed ambassador to the States of the Circle of Lower Saxony, and in this capacity resided long at Hamburg. His tendency to peculation, however, necessitated his return to France, where he had to refund 1,000,000 francs into the public treasury. He now decidedly joined the party which sought the overthrow of the emperor and the restoration of the Bourbons. He was treated with little consideration by them during the first Restoration, yet he followed Louis XVIII. in his flight to the Netherlands upon Napoleon's return, and upon the second Restoration was honored with the title of a minister of state. As deputy from the dept. of Yonne, 1815 and 1821, he showed his weakness of character by opposing all liberal measures, and even institutions for the promotion of science and popular education. The revolution of 1830 and the loss of his fortune (occasioned by extravagance) caused his reason to give way, and he died in a lunatic asylum at Caen. His *Memoirs concerning Napoleon, the Directory, the Consulate, the Empire, and the Restoration* (*Mémoires sur Napoleon*, etc., 10 vols., Par. 1829), gave many new explanations of the events of his time, but were declared by contemporaries to be in many respects untrustworthy: see BOULAY DE LA MEURTHE. The work, however, must always constitute an important part of the materials of history. A work entitled *Histoire de Bonaparte par un Homme qui ne l'a pas quitté depuis 15 Ans*, has been erroneously ascribed to him.

BOURSE, n. *bôrs* [F. *bourse*, a purse, exchange—from mid. L. *byrsa*; Gr. *bursa*, a hide, a skin¹: place where merchants meet; the Exchange in towns on the European continent, particularly in Paris: see EXCHANGE.

BOURTREE, or BOORTREE, n. *bôr'trē*: in *Scot.*, the elder-tree.

BOUSE, or BOOSE, v. *bôz* [Dut. *buizen*; Swiss, *bausen*, to drink deeply: Ger. *bausen*, to swell or puff out: Gael. *busach*, one having a large mouth—from *bus*, a mouth—*lit.*, to supply the mouth too frequently with strong drink]: to drink intoxicants deeply; to guzzle: to carouse: N. the act of drinking long and deeply; a carouse. BOUSING, imp. *bôz'ing*. BOUSED, pp. *bôzd*. BOUSY, a. *bô'zī*: see BOOSE 1: also spelled BOUZE and BOOZE.

BOUSSA, *bôs'sá*: town of Sudan, central Africa, cap. of the dist. of Boussa, on an island in the Niger; lat. 10° 14' n., long. 5° 20' e. It is hemmed in by rocks, and being also surrounded by walls, is a place of considerable strength. A melancholy interest attaches to B. as the death-scene of Mungo Park (q.v.). Pop. estimated 10,000-18,000.

BOUSSOLE STRAIT—BOUTS-RIMÉS.

BOUSSOLE STRAIT, *bó-sol'*: passes through the Kurile Islands, uniting the Sea of Okhotsk and the Pacific Ocean; lat. 46° 30' n. It takes its name from one of the vessels of La Perouse, who, soon after Cook's death, emulated, on the n.e. coasts of Asia, that navigator's explorations on the n.w. shores of America.

BOUSTROPHEDON, *bow-stro-fē'don* [Gr. *bous*, an ox and *strephe*, I turn]: term for a mode of writing practiced by the Greeks in their earlier history—in which the lines did not proceed uninterruptedly from left to right, but alternately, the first line being written from right to left, the second from left to right, etc. Examples are frequent in coins and inscriptions. The method received its name from its resemblance to the path made by oxen in ploughing a field.

BOUT, n. *bout* [Dan. *bugt*, a bend, a turn: Icel. *bugtha*, a bend: Goth. *biugan*, to bend (see BOUGHT)]: as much as can be done at one turn; an attempt; applied to a drinking-match, or a debauch, as a *drinking-bout*.

BOUTADE, n. *bô-tád'* [F. *boutade*, an attack, a push—from *bouter*, to push]: in *OE.*, a whim; a caprice; a sudden fancy.

BOUTEFEU, n. *bót'fô* [F. *boutefeu*, a linstock—from *bouter*, to set or push; *feu*, fire]: in *OE.*, an incendiary; a kindler of feuds.

BOUTELLE, *bô-těł'*, CHARLES ADDISON: journalist and statesman: 1839, Feb. 9—1901, May 21; b. Damariscotta, Me. He was educated at the acad. in Yarmouth, and was in the shipping business for a time; entered the navy as a volunteer 1862, and served through the civil war. In 1870 he became manager of the *Whig and Courier* at Bangor; in 1880 received a unanimous nomination as a republican congressman, and was re-nominated and re-elected for continuous service till 1895. As chairman of the committee on naval affairs in the 51st congress, he drafted the bill which provided the new navy with its first heavy battle-ships. He served on the repub. nat. committee 1884.

BOUTERWEK, *bó'tér-věk*, FRIEDRICH: 1766, Apr. 15—1828; b. Oker, near Goslar, in the Hartz dist.: German philosophical and æsthetical author. He first studied law, then poetry, then turned to philosophy, and the history of literature. In philosophy, he followed first Kant, afterward Jacobi. He became extraordinary prof. of philosophy in Göttingen 1797, ordinary prof. 1802. His great work is *History of Modern Poetry and Eloquence* (*Geschichte der neuern Poesie und Beredsamkeit*, 12 vols., Gött. 1801–19), one of the best German works of its kind, and specially valuable on Spanish literature.

BOUTS-RIMÉS, *bó-re-mā'* [Fr. rhymed endings]: a kind of verses in which the final rhymes are given out by one member of a party, and the lines are then filled up by others to suit the endings. Suppose the rhymes prescribed are *wave*, *lie*; *brave*, *die*; the following are two of the ways in which the lines might be completed:

BOUTWELL—BOUVIER.

Dark are the secrets of the gulfling	wave,
Where, wrapped in death, so many heroes	lie;
Yet glorious death's the guerdon of the	brave,
And those who bravely live can bravely	die.

Whenever I sail on the	wave,
O'ercome with sea-sickness I	lie;
I can sing of 'the sea,' and look	brave;
When I feel it, I feel like to	die.

BOUTWELL, *bowt'wel*, GEORGE SEWALL, LL.D.: statesman: 1818, Jan. 28———; b. Brookline, Mass. As a boy he worked on his father's farm; but entered a store in Groton, Mass., 1835, as a clerk; meanwhile he studied law and was admitted to practice. He became a partner in the establishment where he had been employed, and continued there until 1855. He strongly supported Van Buren for the presidency 1840, was elected as a democrat to the Mass. legislature 1842, and was continuously re-elected until 1851. During this period he ran for congress several times, and for gov. twice, but was defeated until 1851, when he was elected to congress, and re-elected the following year. He assisted in organizing the republican party, was a member of the republican national convention which nominated Lincoln 1860, and a member of the peace conference at Washington 1861. In 1862, at the request of Pres. Lincoln, he organized the new internal revenue dept., becoming its first commissioner, and holding the position 1862, July—1863 Mar. He was elected to congress from Mass. 1862, and twice re-elected, and was one of the managers of the impeachment trial of Pres. Andrew Johnson. Pres. Grant appointed B. sec. of the treas. 1869, Mar. He resigned 1873, Mar., having been elected senator from Mass. to fill the unexpired term (1873-77) of Vice-Pres. Wilson. In 1877 Pres. Hayes appointed him to codify the statutes at large, and he eventually settled in Washington, D. C., where he practiced law. He has published important works on taxation and on educational subjects.

BOUVET, *bô-vâ'*, JOACHIM: d. 1732, June 28: learned French Jesuit, one of a company of 6 sent by Louis XIV. to China to acquire information concerning that country, 1686. B. gained the special confidence of the emperor, at whose request he brought 10 more missionaries in 1699.

BOUVAR'DIA: genus of plants of the nat. ord. *Cinchonaceæ* (q.v.); of the same tribe with the *Cinchona* (q.v.), or Peruvian Bark. The calyx is 4-partite, with teeth between the segments, the corolla tubular and 4-fid; the stamens 4, included within the corolla; the capsule 2-celled. The species are natives of Mexico. One of them, *B. triphylla*, with oblong ternate leaves and trigonous branches, has obtained a place among favorite ornaments of flower-borders, but requires careful protection from frost. To preserve it the roots are generally taken up and are sometimes placed in a greenhouse or frame for the winter—sometimes in a dry cellar. Its beautiful corymbs of scarlet flowers are produced from June till November.

BOUVIER, *bô-vêr'*, Fr. *bo-ve-â'* JOHN: 1787-1851; b. at Codognan, France: jurist and author. He came to

BOVALI—BOVIDÆ.

America about 1802, studied law, settled in Philadelphia, and became judge of the court of criminal sessions in 1838. He published: a *Law Dictionary* (1839, 2 vols.), and *Institutes of American Law* (1851, 4 vols.), both valuable works with high reputation.

BOVALI, *bo-vá'le*, or BOALI, *bo-á'lē*: town in Africa, cap. of the kingdom of Loango, on the river Bovali, near the Atlantic coast; lat. 4° 30' s., lon. 12° 1' e. It is in a productive but unwholesome region. Its exports are ivory, pepper, dye-woods, and slaves. Pop. about 15,000.

BOVEY COAL, *bō'vī*: a form of wood-coal or lignite, named from Bovey, Devonshire, Eng., where it is found.

BOVIDÆ, *bō'vī-dē* [Lat. *bos*, an ox]: family of ruminating mammalia (see RUMINANTIA); division *Caricornia* (hollow-horned), or, by others, last of 3 sub-divisions—viz., Antilopidæ, Ovidæ (sheep and goats), and Bovidæ (oxen), to which last it may be confined in this article. The B. are all large animals, with stout limbs and broad muzzle. The facial outline is nearly straight. Their dentition agrees with that of some of the other ruminants, as sheep, goats, and antelopes; they have eight cutting-teeth in the lower jaw and none in the upper, but instead of them a fibrous and elastic pad, which covers the convex extremity of the anterior maxillary-bone; they have no canine teeth, but a large interval between the cutting-teeth and the grinders, which are six on each side in each jaw. In eating they collect and roll the grass together 'by means of the long and movable tongue; it is firmly held between the lower cutting-teeth and the pad, the cartilaginous upper lip assisting in this; and, then, by a sudden nodding motion of the head, the little roll of herbage is either torn or cut off, or partly both torn and cut.' Both sexes are furnished with unbranched, tapering horns, directed more or less laterally, and generally upward and forward, and usually curved through their whole length. There are, however, breeds of the common ox, in which both sexes are destitute of horns. The tail is rather long and terminated by a tuft of long hair. The females have four teats. All the B. are gregarious. Native species are found in Europe, Asia, Africa, and N. America. Fossil remains of species which no longer exist have been found in pliocene and pleistocene deposits. The number of existing species is not certain, as, beside the difficulty of deciding in some cases what are to be deemed species and what merely varieties, there is still great deficiency of accurate information concerning the B. of different parts of the world. The very magnitude of the animals has probably prevented so frequent a comparison of specimens as would otherwise have taken place. It has recently been ascertained that the number of species is larger than had been supposed. Attempts have been made to divide the genus *Bos* into several genera, but they are not very clearly nor strongly distinguished. All the B. are valuable to man for their flesh, tallow, skin, etc.; but some of them, having long been reduced to domestication,

BOVINE—BOW.

are among the most valuable of all domestic animals, particularly the common ox, different kinds of buffalo, and the yak of Tatarv.—See ARNEE: BANTENG: BISON: BUFFALO: GAUR: GAYAL: GALLA OX: MUSK OX: OX: PEGASSE: URUS: YAK: ZAMOUSE: ZEBU: etc.

BOVINE, a. *bō'vīn* [L. *bovem*, an ox]: pertaining to animals of the ox kind. **BOVIFORM**, a. *bō'vī-fu'wrm* [L. *forma*, shape]: resembling the ox.

BOVINES, or **BOUVINES**, *bō'vīn'*: village of France on the Marq, seven m. s.e. of Lille, remarkable for a great battle, 1214, July 27, in which Philip Augustus, King of France, with about 75,000 men defeated Otho IV., Emperor of Germany, and his allies, whose combined force is variously reported to have numbered from 100,000 to 200,000 men (the last number undoubtedly an exaggeration). This great victory contributed more than any other to the unity and freedom of France, which had been continually menaced by feudalism and ambitious foreigners.

BOVINO, *bō-vē'nō*: fortified town in the province of Foggia, s. Italy, about 20 m. s.s.w. of Foggia. It is the see of a bishop, has a cathedral, churches, and convents. The valley of B. was formerly notorious as the haunt of the brigands of Capitanata, and the town still has the unenviable reputation of being the nursery of all the highway robbers of this portion of the Apennines. B. occupies the site of the ancient *Vebinum*. The Imperialists defeated the Spaniards here 1734. Pop. 7,900.

BOW, v. *bow* [AS. *beogan*; Icel. *buga*; Dut. *buigen*; Goth. *biugan*, to bend: Ger. *beugen*, to turn to flight]: to bend; to bend the body in token of respect; to crush; to depress; to stoop: N. an act of respect by bending the body, or by inclining the head; a bend **BOW'ING**, imp.: N. the act of one who bows. **BOWED**, pp. *bowd*.

BOW, n. *bō* [Ger. *bogen*, a curve: Icel. *bogr*; Sw. *bog*, bow of a ship: W. *bog*, a swell, a rising up: Gael. *bogha*, a curve—from *bogh*, to bend: AS. *boga*, a bow, an arch]: anything curved or arched; an instrument for shooting arrows with; a name given to various instruments having a curved form, as a *violin-bow*; the curved doubling of a ribbon or string in a slip-knot; in *OE*, an ox-yoke: **ADJ.** curved or arched, as a *bow-window*. **Bow**, *bow*, or **BOWS**, *bowz*, n. the rounding forepart of a ship. **BOW-BEARER**, *bō*, an under-officer of a forest, who looked after trespasses affecting 'vert or venison.' **BOW-CHASER**, *bow-*, a gun that can be fired from the bow of a ship in chasing another. **BOW-COMPASS**, *bō*, a beam of wood or brass, with three long screws, that bend a lath of wood or steel to any arch. **BOW-GRACE**, n. *bow'grās*, a frame of old rope or junk placed round the bows and sides of a vessel to prevent injury from ice. **BOW'LEGGED**, a. *bō*, having crooked legs; bandy-legged. **BOWLINE**, n. *bow'līn*, also spelled **BOWLING**, *bow'ling*, or **BOLIN**, *bō'līn*, in *nav.*, a rope fastened near the outer or perpendicular edge of a square sail leading toward the bow, to tighten the sail and enable the ship to keep near the wind. **BOWMAN**, n. *bow'mān*, the man who rows the foremost oar in a boat; *bō'mān*, an

BOW—BOW AND ARROW.

archer. **Bow'NET**, n. *bow-*, an engine made of wicker-work for catching lobsters, crawfish, etc. **Bow PEN**, *bō-*, a sort of pen for ruling lines on paper, etc., consisting of two metallic sides bowed or curved, but made to meet at a point for holding the small dip of ink. **Bow-SHOT**, n. *bō-*, the space over which an arrow may pass when shot from a bow; a place not far distant. **BOWSPRIT**, n. *bō'sprīt*, or **BOLTSPRIT** [*bow* and Dut. *spriet*, properly a piece of cleft wood, the yard of a sail: Gael. *spreòd*, a projecting beam]: a large boom, spar, or mast, which projects over the stem or head of a ship. Its use is to carry sail forward, as a means of counteracting the effect of the after-sails, and keeping the ship well balanced. It is also a support of the fore-mast, which is fastened to it by large stays or ropes. In ordinary ships of war, the bowsprit rises at an angle of about 45° from the horizon, and is generally about two-thirds as long as the mainmast; but in many kinds of vessels the position is more nearly horizontal. **Bow-SAW**, *bō-saw*, a flexible saw for cutting curves. **Bow-STRING**, n. *bō-*, string of a bow; a string or cord used by the Turks in putting criminals to death by strangling them. **Bow-WINDOW**. n. *bō-*, a window of a semicircular form; a bay-window. **ON THE BOW**, *bow*, seen over the bow of a ship within 45° on either side of the prow. **ON A BOW LINE**, *bow*, said of a ship sailing close to the wind, or close-hauled. **TWO STRINGS TO HIS BOW**, *bō*, *two* means to accomplish the end in view, if the one fails he can try the other—alluding to archers carrying reserve strings for their bows. *Note*.—The two preceding entries are identical in their etymology though differently pronounced. The confusing and perplexing variations in the pronunciations of this paragraph might well have warranted separate entries, had it been at all practicable or desirable.

BOW, of a Ship: general name for the forepart, or that which breasts the waves. Very often the word is used in the plural, the ship being considered to have starboard and larboard, or right and left bows, meeting at the prow or figure-head. A narrow or *lean* bow and a broad or *bluff* bow are seamen's phrases for different shapes of bow, each of which has its own peculiar advantages at sea; a narrow bow will cut more smoothly through the water, but a broad bow bears up more firmly in a high sea.

'On the bow,' in sea-language, is the position of a distant object when seen over the bow; it implies a sweep of one quarter of the horizon, embracing about 45° on each side of the prow or head.

BOW AND ARROW: implements of warfare, or of sport. For the military place of bowmen in armies of the middle ages, see **ARCHERS** and **ARCHERY**. For description of the cross-bow see **ARBALEST**. The long-bow gained ascendancy in England in the 14th c. It was found that a dozen arrows could be discharged from this weapon while the arbalester was winding up his cumbrous cross-bow and discharging one arrow or quarrel from it. Moreover, the long-bow being held vertically, the bowmen were able to stand in closer array than the arbalesters; they

BOWDICH—BOWDITCH.

were enabled, also, to take a greater supply of the munitions of war into the field, seeing that the bow and arrows were much lighter in weight. In the time of Edward III. a bow was priced 1s. to 1s. 6*d.*, and a sheaf of arrows, 1s. to 1s. 2*d.*; in the time of Henry VIII. the price (fixed by law) of the bow varied from 6*d.* to 3*s.* 4*d.* The last-named monarch adopted extraordinary means for encouraging the use of the long-bow. Many ordinances were issued for insuring a good supply of bow-staves. The bowyers, string-makers, fletchers, and arrow-head makers were all placed under stringent regulations. Merchants were compelled to import good bow-staves with cargo, in certain proportions. Very long bow-staves were admitted duty-free. Yew was considered the best wood, but in order that the supply should not be too speedily used up, bowyers were ordered to use elm, ash, and wych-hazel in certain proportions to yew. The heads of families were bidden to provide bows for their sons and servants, and town-councils or officers were required to provide shooting-butts just outside each town. Some of the bows had two arches, connected by a middle straight piece. The best length was regarded as about 5 ft. 8 in. from nock to nock, but in earlier times some of the bows were much longer. The first arrows were made of reeds; these materials were superseded by cornel-wood; but the wood finally adopted as the best was ash. The arrows had heads pointed with steel, sometimes barbed to render their action more terrible. They were feathered with portions of goose-wing. The best length of arrow for a bow of the above-named size was set down at 2 ft. 3 inches. Sometimes the arrows were tipped with combustibles. The best makers of arrow-heads, as well as bows, were compelled by law to go from town to town, to exercise their craft wherever it was most needed. The bowman usually carried 24 arrows, called a sheaf, or a quiver, at his right side or at his back, beside others in his girdle. He kept his bow in a case; hence Falstaff's comparison of Prince Hal to a bow-case, in allusion to his slenderness. Bowmen, in their hours of sport, used arrow-heads called *rigged*, *creased*, *shouldered*, and *spoon-headed*, according to the shape.

BOWDICH, *bow'dich*, THOMAS EDWARD: 1790, June—1824, Jan. 10; b. Bristol, Eng.: African traveller. He was first engaged in trade in his native city, but afterward appointed a writer in the service of the African Company. Selected, 1816, to conduct a mission to the king of Ashantee, he published an account of it, 1819, 4to. On his return to Europe he resided some years in Paris. To obtain funds for a new expedition into the interior of Africa, he published a translation of Mollien's *Travels to the Sources of the Senegal and Gambia*, and other works, and 1822, Aug., sailed from Havre. He died of fever on the river Gambia. A profound scholar and accomplished linguist, B. was a member of several literary societies in England and on the continent.

BOWDITCH, *bow'dich*, NATHANIEL: 1773, Nov. 26—

1838, Mar. 16; b. Salem, Mass.; American astronomer. He showed at a very early age a great inclination for mathematics, in which he afterward made great proficiency, without the advantages of a collegiate education. He was at first trained to his father's trade of a cooper, and afterward apprenticed to a ship-chandler. He acquired Latin that he might study Newton's *Principia*. He gave especial study to the practical applications of science. He went as supercargo of a merchant-ship in several long voyages, and added a thorough practical acquaintance with navigation to a theoretical knowledge of it. His work, *The American Practical Navigator*, was received with great favor. He published also an admirable translation of La Place's *Mécanique Céleste* (2 vols., Boston, 1829), to which he added valuable annotations. These works obtained marks of honor from scientific societies in Britain, and led to his being called to the professorship of mathematics and astronomy in Harvard College, which, however, he declined, in order to enter the executive council of the state. He afterward became manager of the Massachusetts Life Insurance Assoc., pres. of the Mechanics' Institute, and pres. of the Acad. of Arts and Sciences in Boston.

BOWDOIN, *bō'd'n*, JAMES, LL.D.: governor of Massachusetts: 1727-90; b. Boston, son of Pierre Baudoin, a Huguenot, who fled from Rochelle, France, to New England 1687. He graduated at Harvard (1745) and contributed much by writing and speech to sustain the zeal of his fellow-patriots in the war for independence. He was elected pres. of the colonial council of government, 1775, and became gov. 1785, being the successor of John Hancock. He showed executive ability by a prompt suppression of Shay's rebellion (1786-7). B. was a member of the convention that ratified the federal constitution in 1789. After the impairment of his health had obliged him to quit public functions he devoted his time entirely to the sciences and literature. He was an associate of Franklin; one of the founders, and for a long time pres. of the Acad. of Arts and Sciences at Philadelphia, to which he also presented his library. His name was given to the first college in Maine.

BOWDOIN, JAMES: 1752-1811: son of Gov. B. He graduated at Harvard, was for some time a student at Oxford, and travelled in Europe, returning to his native country shortly after the battle of Lexington. In 1805, he was appointed minister to Spain, one of the objects of his mission being to negotiate the cession of Florida to the United States. To Bowdoin College, named after his father, he left 6,000 acres of land, besides the island of Naushon, his library, and a large collection of philosophical apparatus.

BOWDOIN COLLEGE: oldest and one of the most prominent educational institutions in Maine; in the town of Brunswick, on the right bank of the Androscoggin river, near the ocean. It was named after Governor James Bowdoin, and received (1794) its charter from the legislature of Massachusetts, of which state Maine formed then a part. The charter declared that the object of the institution was 'to promote virtue and piety, knowledge of the languages,

BOWDOIN COLLEGE.

and of the useful and liberal arts and sciences.' The government, as then formed, consisted of a board of trustees, and a board of overseers. In 1801 Joseph McKeen, a graduate of Dartmouth, was elected as the first pres., and John Abbott, a Harvard graduate, as prof. of languages. Eight students were admitted, 1802, and four years later, the new college bestowed its first honors upon eight graduates. At that time the whole college, including the residences of the professors, occupied but one building. Pres. McKeen died, 1807, and Jesse Appleton, D.D., became his successor, and filled the office efficiently for 12 years. James Bowdoin, the younger, who had given the college about \$5,000, and 1,000 acres of land, gave before his death more land, also books, paintings, and mineralogical specimens. William Allen, D.D., ex-pres. of Dartmouth, was pres. of B. 1819-39; Leonard Woods, D.D., until 1866; Samuel Harris, S.T.D., until 1871; Joshua L. Chamberlain, LL.D., until 1883; Alpheus Spring Packard, D.D., acting pres., 1883-85; and William De Witt Hyde, D.D., pres. since 1885. There are now half a dozen or more spacious and commodious brick buildings, besides the Memorial Hall and chapel, built of granite. As the active movers in the establishment of the college were mainly Harvard men, it was but natural that most of the teachers of the first 20 years should have been called from Harvard graduates. Prof. Abbot, 1784; Prof. Cleaveland, 1799; Tutors Willard and Parker, 1803; Norton, 1804; Burge, White, and Tappan, 1805; Whitman, 1809; Brigham and Fales, 1810; Lamson, 1814; Briggs, 1815; Green and Newman, 1816; and Cummings, 1817, are revered representatives of the early instructors. They were followed by able men of the college's own alumni: Cleaveland, 1813; Hale, 1818, afterward pres. of Hobart College; Abbott, 1822; Goodwin, 1832, afterward pres. of Trinity College; Smith, 1834; Chamberlain, 1852; Wittlesey, 1842; and Everett, 1850. In 1902 it had 40 professors and instructors, 391 students, 91 scholarships, 73,000 volumes in the library, scientific apparatus valued at \$100,000, grounds and buildings \$500,000, productive funds \$629,000, receipts from tuition \$31,090. The recent benefactions have been large. An interesting feature of the library is the provision of an alumni alcove, devoted entirely to the published works of graduates of the college. In 1886 it was estimated that 1,000 volumes and more than 4,000 pamphlets had been written by 2,300 graduates. The library also contains framed and in cases a collection of drawings, which has been pronounced the finest in the country after that in the Metropolitan Museum of Art in New York. A handsome brick gymnasium was erected 1886. Recent notable gifts are the \$400,000 bequest from Mrs. E. M. Garcelon, \$100,000 from the estate of Daniel Fayerweather, and the building to be known as the Searles Memorial Scientific School. Among noteworthy graduates were Nathaniel Hawthorne and Henry W. Longfellow, who had as fellow-students William Pitt Fessenden, Geo. B. Cheever, D.D., Franklin Pierce (pres. United States), and John P. Hale. Longfellow was for some time prof of lan-

BOWELS—BOWEN.

guages. The curriculum comprises the branches usually studied in American colleges, but some of the languages are optional. There is a scientific course for undergraduates, in which the title B.S. is conferred; also a post-graduate course of two years in the study of philosophy and the arts. There is also provision made for military instruction. Graduates who have honorably completed a post-graduate course may receive the appointment of resident Fellows, and enjoy all the privileges for two years longer without further charge. In the medical school there are 9 professors and about 100 students. Pres., Wm. DeWitt Hyde.

BOWELS, n. plu. *bow'ēlz* [OF. *boēl*, a gut, a bowel: F. *boudin*, a black-pudding—from mid. L. *botel'lus*, an intestine: It. *budello*, a gut]: entrails; intestines; tenderness; pity; compassion; interior, as bowels of the earth; among *surgeons*, used often in the singular, **BOWEL**. **BOW'EL**, v. to take out the entrails. **BOW'ELLING**, imp. **BOW'ELLED**, pp. *-ēld*, having bowels or a belly; having had the bowels taken out. **BOW'ELLESS**, a. without tenderness or pity—the bowels being anciently considered the seat of pity.

BOWEN, *bō'ēn*, FRANCIS, LL.D.: author: 1811, Sep. 8, —1890, Jan. 21; b. Charlestown, Mass. He graduated at Harvard 1833, and was instructor in intellectual philosophy and political economy in that univ. 1835–39; then spent two years in Europe. Soon after his return to America he became editor of the *North American Review*, a position which he held nearly 11 years. He lectured on metaphysical and ethical subjects before the Lowell Inst., Boston; and 1850 lectured also on political economy. B. was appointed 1853 Alford prof. of nat. religion, moral philosophy, and civil polity at Harvard. From 1858 he lectured before the Lowell Inst. on the English metaphysicians and philosophy from Bacon to Sir William Hamilton. In his philosophical works B. opposed the systems of Kant, Fichte, Cousin, Comte, and John Stuart Mill. In polit. economy he opposed the free-trade doctrines of Adam Smith, Malthus in his ideas on population, and Ricardo in his views of rent. Among his works are a treatise on *Political Economy*; *Treatise on Logic* (1864); *Modern Philos. from Descartes to Schopenhauer and Hartmann* (1877).

BOWEN, *bō'ēn*, HENRY CHANDLER: publisher: 1813, Sep. 11—1896, Feb. 24; b. Woodstock, Conn. He was educated at Woodstock Acad.; was in mercantile business many years; was collector of internal revenue under Pres. Lincoln; has been the owner and publisher of *The Independent* many years; and since the close of the civil war has held annual receptions on July 4 at his Woodstock farm, where the most eminent men in the country have united in patriotic exercises. He purchased *The Independent* when its circulation was small, and has made it a valuable and influential property. Theodore Tilton was editorially connected with it 1856–71, and in the latter part of this period was editor-in-chief, succeeding Henry Ward Beecher. B. was one of the founders of Plymouth Church, Brooklyn; but, 1875–6, having been

BOWEN.

understood to make the gravest charges against its pastor, he was called to substantiate them; and after full hearing, it was voted that he had failed to do this, and his connection with the church was terminated.

BOWEN, HERBERT WOLCOTT: an American diplomatist; b. 1856, Feb. 19; was educated at the Brooklyn Polytechnic Institute, Yale University, and in Europe; studied law in the Columbia Law School and practiced in New York city till 1890, when he was made U. S. consul to Barcelona, Spain. He was appointed consul-general at the same place in 1895, and became minister to Persia 1899, May, and to Venezuela 1901, June. In 1902, after Great Britain and Germany united in a naval demonstration on the Venezuelan coast to force payment of claims against it, Minister Bowen was appointed a special commissioner of Venezuela to represent it in negotiations with England, Germany, and, subsequently, Italy. After a conference in Washington, D. C., President Roosevelt declined to arbitrate the differences and they were referred to the Hague Tribunal.

BOWEN, JAMES: military officer: 1808-1886, Sep. 29; b. New York. He inherited an ample fortune from his father, and was the first pres. of the Erie railway. He was also a member of the legislature 1848-9, and held other offices, state and municipal. On the outbreak of the civil war he organized a sufficient number of regiments to form a brigade of vols., of which he was made brig.gen. 1862, Oct. 11. He resigned 1864, and was brevetted maj.gen. vols. 1865. He was provost-marshal gen. of the dept. of the Gulf, after Gen. Butler left New Orleans. B. served as commissioner of charities in the city of New York for a number of years. He was a man of literary attainments, and a congenial associate of the leading men of New York.

BOWEN, OLIVER: naval officer: b. in the 18th. c.; d. 1800, Aug. He was a member of the provincial congress of 1775 and of the council of safety. While stationed on Tybee Island, near Savannah, 1775, July 10, he was successful in seizing a large quantity of powder stored there. In 1778 he was in the naval expedition against Wilmington, N. C. He died in Providence, R. I.

BOWEN, THOMAS M.: senator: 1825, Oct. 26———; b. near the present site of Burlington, Iowa. He studied law and was admitted to practice in Wayne co. when he was 18 years of age, and was elected to the legislature 1856. Two years later he removed to Kansas, and 1861, June, entered the army with rank of capt., but soon afterward raised the 13th. Kan. infantry, of which he continued in command during the war, rising to the rank of brevet brig.gen., and for the last two years commanding a brigade. In 1864 he was a delegate from Kan. to the national republican convention. He settled in Ark. at the close of the war, where he was for several years a justice of the state supreme court. In 1871, he held the appointment of gov. of Idaho. He afterward settled in Colorado, practiced law, was 4 years a dist. judge, and was elected to the United States senate 1883.

BOWER—BOWERBANKIA.

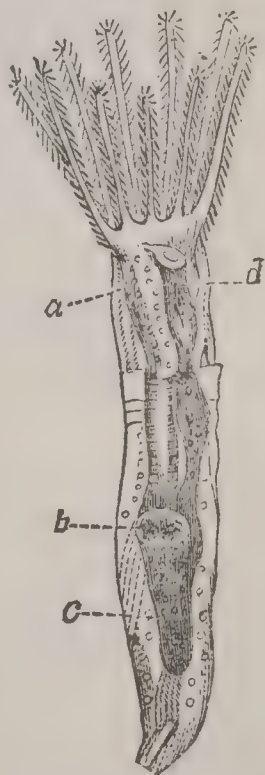
BOWER, n. *bow'ér* [Icel. *bur*, a separate apartment: AS. *bur*, a chamber: W. *bwor*, an inclosure]: a private chamber or retreat; a boudoir; 'ladies' bower,' a private apartment in ancient castles and mansions, used by ladies both as a parlor and sleeping-chamber.

Up, then, rose fair Annet's father,
Two hours or it were day,
And he is gane into the bower
Wherein fair Annet lay.

Ballad of *Lord Thomas*.—*Percy's Reliques*.

In a *garden*, a place covered with trees bent and entwined; a shady retreat; a cottage covered with creeping plants. **BOWER**, v. *bow'ér*, in *OE.*, to lodge. **BOWERY**, a. *bow'ér-ī*, shady; containing bowers. **BOWERED**, a. *-ērd*, supplied with bowers. **BOWER-BIRD**, an Australian bird like a starling, which constructs an extraordinary habitation. *Note*.—The Scotch *byre*, a cow-house, is another spelling and application of *bower*, which originally signified a place to lie in, a dwelling-place: compare F. *bouverie*; Sp. *boyéra*, an ox-stall, a cow-house.

BOWERBANKIA, *bow'ér-băng-kî-a*: a mollusoid genus, class *Polyzoa* or *Bryozoa*, order *Infundibulata*, the structure of which has been very carefully studied in the common British species, *B. imbricata*, one of the most abundant zoophytes on the coasts both of England and Scotland. It grows on sea-weeds, corallines, stones, etc., between high- and low water mark, or in no great depth of water, and forms branching tufts sometimes $1\frac{1}{2}$ inch in height. The branches are smooth and transparent, tubular, filled apparently with a granular fluid, and crowded with irregularly scattered clusters of delicate horny ovate or ovate-cylindrical cells, so transparent as to permit the most easy observation of the whole internal structure. The zoöides, now named *polypides*, all are connected with the tube of the branch, and so with the common life of the *polypidom*. Each, fully expanded, is about one-twelfth of an inch in length, and has 10 finely ciliated tentacula. When alarmed it contracts very rapidly, the tentacula being first drawn in, and then the body of the polypide pulled into its cell. The organization is much higher than in many zoophytes. The mouth does not lead at once into the stomach, but into a funnel-shaped tube, which contracts into a gullet or *esophagus*, *a* in fig., and ends in a globular gizzard *b*, apparently provided with radiating muscular fibres, and intended for trituration of the food. The gizzard opens below into a bag, regarded as the true stomach, *c*, and is supplied with a fluid, regarded as bile, from minute follicles or sacs in its

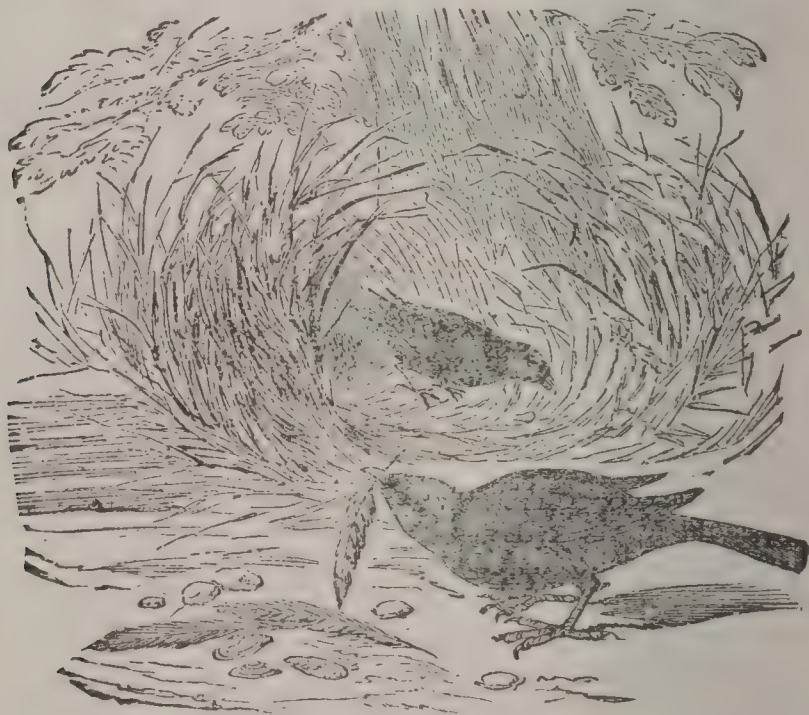


Bowerbankia imbricata.
Greatly magnified.

BOWER-BIRD.

sides, which follicles are therefore regarded as representing the liver. From the upper part of the stomach, near the entrance from the gizzard, arises the intestine *a*, a straight tube which passes up by the side of the gullet, and terminates in an orifice outside the circle of tentacula, the structure thus exhibiting a strong resemblance to that of the Ascidian Mollusca. When the zoöid is retracted the gullet is bent upon itself, and the tentacula are inclosed in a tube or sheaf formed by the inverted integument. When the zoöid is vigorous and lively, the cilia of the tentacula are kept in active motion, apparently quite under control of the will of the animal, forming a kind of whirlpool to bring animalcules or organic particles into the mouth.

BOWER-BIRD: Australian bird of the Starling (q.v.) family, or *Sturnidæ*, remarkable for their habit of making bower-like erections, called *runs* by the colonists of New South Wales, and for adorning them with gay feathers, rags, bones, shells, and such other white or brightly-colored objects as they can pick up. These bowers are not nests, but they appear to be places of much resort at the breeding-season in particular. The use made of them by the birds is



Spotted Bower-bird.

very imperfectly understood; but their structure has been carefully examined, and fine specimens of them, transported with no little difficulty have been deposited in the British Museum by Mr. Gould, in whose work on the *Birds of Australia* an account of them was first given to the world. The bowers of the Satin B. (*Ptilonorhynchus holosericeus*) are built among the branches of some tree, and appear to be repaired and frequented from year to year. The base consists of an extensive and rather convex platform of sticks, firmly interwoven, on the centre of which the bower itself is built of more flexible twigs. It is chiefly at and near the entrance that the shells, feathers, etc., employed for decora-

BOWIE-KNIFE—BOWING TOWARD THE ALTAR.

tion are placed. The bowers of the Spotted B. (*Chlamydera maculata*) are longer and more avenue-like than those of the Satin B.; they are placed upon the ground, and are outwardly built of twigs, and beautifully lined with tall grasses so disposed that their heads nearly meet. The decorative propensity appears in the highest degree in this species. 'In some of the larger bowers, which had evidently been resorted to for many years,' Mr. Gould says, 'I have seen nearly half a bushel of bones, shells, etc., at each of the entrances.' These are arranged in much the same way at both entrances. Small pebbles are often transported by the birds from considerable distances.

The Satin B. is particularly abundant in the mountainous districts of the w. of New South Wales, and is found in all the 'brushes' from the mountains to the coast. The adult male has the whole plumage of a deep, shining black. The colors of the female are grayish green and brown, curiously mingled.—The spotted B. rather smaller than the Satin B., or about the size of a starling, has a general color of rich brown, beautifully marked with black and buff; a band of elongated feathers of light rose-pink crossing the back of the neck, and forming a broad, fan-like, occipital crest. It is exclusively an inhabitant of the interior of Australia.—Another species, the Great B. (*Chlamydera nuchalis*), considerably larger than either of the others, and very similar in form and plumage to the Spotted B., has been found on the n.w. coast of Australia. Its bowers are always adorned with sea-shells, even when at a distance from the sea.

BOWIE-KNIFE, n. *bō'ī-nīf* [said to be named after its inventor, *Col. James Bowie*, a daring character of the s.w. United States]: a long, sharp-pointed knife or short sword, used by hunters and pioneer settlers; and, being always at hand, too liable to be used in a quarrel. It was often carried concealed in a sheath. Of late years its use is infrequent except on the extreme frontiers of civilization.

BOWING TOWARD THE ALTAR: an ancient practice in the church, derived from a belief in the superior sanctity of the east. There are scriptural allusions to the east, from which notions of this kind may have been drawn. 'And, behold, the glory of the God of Israel came from the east'—*Ezek.* xliii. 2: 'For we have seen his star in the east'—*Matt.* ii. 2. There was also an early legendary belief that Christ coming to judgment would appear in the east. For these, and other reasons, it became customary to place the altar, with the crucifix and other symbols, at the eastern extremity of the church, to which all bowed, and toward which, in prayers, all turned. In the Roman Church, the practice continues of bowing toward the altar, or more correctly toward the Host, on entering and departing from the church. Brand's *Popular Antiquities*, edited by Sir Henry Ellis, contains much curious antiquarian lore on this subject. It was further a custom in the early Christian Church to bow at the name of Jesus. This is still done in the Church of Rome, at

BOW ISLAND—BOWLDER-CLAY.

whatever part of the service the name occurs. In the Church of England, it is customary to bow at the name of Jesus only in repeating the *creeds*. This ancient usage is traced to *Phil.* ii. 10, 'That at the name of Jesus every knee should bow.' Punctilious bowings and turning toward the east in repeating the *creeds*, have in late times given rise to dissensions in the Church of England. These practices were sternly antagonized by the Puritans; and are not usually favored by non-prelatical sects.

BOW ISLAND, *bō*: island of coral formation in the s. Pacific, the largest in the Low archipelago; about 30 m. long and 5 m. broad. It can be approached only through a small opening in the reef at the n. end. Within the lagoon, the anchorage is safe. The e. side is well wooded but the w. is low and barren. Pearl oysters and other shell fish abound in the lagoon. The inhabitants are few, ill-looking, and indolent, with a partiality for raw food. The island was discovered 1768 by Bougainville, who gave it the name of La Harpe, which Cocke, who visited in the following year, changed to the name it now bears.

BOWL, *n.* *bōl* [*F.* *boule*, a wooden ball, a drinking-vessel—from *L.* *bulla*; *It.* *bolla*, a bubble, a boss: *Icel.* *bolla*, a bubble; *bolli*, a teacup]: a circular hollow vessel; a basin; a fountain; a wooden ball or large marble used for play on a level plot of ground, or in the room of a house: *V.* to roll as a bowl; to play at bowls; in *cricket*, to fling the ball toward the batsman. **BOWL'ING**, *imp.*: *N.* the art or act of playing at bowls. **BOWLED**, *pp.* *bōld*. **BOWL'ER**, *n.* one who plays at bowls; one who bowls at cricket. **BOWL'ING-GREEN**, *n.*, or **BOWL'ING-ALLEY**, *n.* a place for playing at bowls. **To BOWL OUT**, in *cricket*, to knock down the wicket of an opponent by bowling, and so put him out of the game.

BOWLDER: see **BOULDER**.

BOWLDER CLAY: see **BOULDER CLAY**.

BOW-LEGGED—BOWLES.

BOW-LEGGED, a. *bō'lēg-gēd* or *bō'lēgd*: having the legs bending outward; bandy-legged; due in the majority of instances to Rickets (q.v.); the reverse of knock-knee, which has its origin in the same disease. There is a deficiency of lime salts in the bone, and an excess of the gelatinous material, so that the bone is unable to bear the weight of the body without giving way.

BOWLER, *bō'ler*, METCALF: revolutionary patriot: b. about 1730. Nothing is known of his early history, and his name is remembered only in connection with an important British act 1774. A royal decree had been issued transferring the seat of govt. of the Mass. colony from Boston to Salem, and closing the former place as a port of entry: this was a penalty for the patriotic sentiment shown in Boston. B. was at this time speaker of the R. I. assembly, and went to Boston to proclaim the union of the 13 colonies in opposition to the decree—the first official act of resistance to the royal authority on the part of the colonies.

BOWLES, *bōlz*, FRANCIS TIFFANY: naval architect: 1858, Oct. 7—————; b. Springfield, Mass.; nephew of Samuel B. (q.v.). He was distinguished for scholarship at the U. S. Naval Acad., Annapolis; and after his graduation was selected to attend the Brit. school of naval architecture at Greenwich, England. He was appointed asst. naval constructor in the U. S. navy 1881; sec. to the naval advisory board at Washington 1882–86; then put in charge of construction and repairs at the navy-yard Norfolk, Va.; promoted naval constructor 1888. In 1901 he was commissioned chief constructor of the navy, with the rank of rear-admiral.

BOWLES, SAMUEL: journalist: 1826, Feb. 9—1878, Jan. 16; b. Springfield Mass.; son of Samuel B., founder of the Springfield weekly *Republican*. He was educated at a private school in Springfield, but, at the age of 17, was working in his father's printing office, and a year later induced his father to start the *Daily Republican* 1844, Mar. 27, the first attempt of this character in Mass., outside of Boston. The *Republican* began as an evening paper, but within two years was changed to a morning issue, and was then a financial success, and by 1850 had the largest circulation of any daily newspaper in New England, Boston excepted. B.'s health gave way 1845, and he passed a winter in the South, at the same time contributing a series of letters to his paper, which attracted wide attention. He associated with him in the editorial dept., Dr. J. G. Holland (afterward editor of *Scribner's Magazine*), who continued one of the editors of the *Republican* till 1857, and contributed to it till 1860. Samuel B., Sr., died 1851, and the entire business management of the paper came into the hands of his son. In 1857, for a few months, he was editor of the Boston *Traveller*; but that year he bought Dr. Holland's interest in the *Republican*, and took full control. In his editorial work he showed amazing industry and unflinching fearlessness. Originally a whig, B.

BOWLES.

became one of the founders of the new republican party, and supported Fremont for the presidency 1856, at the same time advocating universal suffrage, without regard to color or sex. He also headed, 1855, an organized movement in Boston designed to break down the recent know-nothing (or anti-foreign) supremacy in Mass. During the civil war, the *Republican* was a powerful advocate of the Union; and it continued to sustain the republican party until 1872, when it supported Horace Greeley for the presidency. From that time forward it assumed an independent position in politics, meanwhile acquiring national reputation for literary ability, intellectual vigor, and journalistic enterprise. B., though personally charming and friendly, kept his friendship distinct from his editorship. He visited Europe 1862, 70, 71, and 74. He wrote several books, including *Across the Continent*; *The Switzerland of America*; and *Our New West*. He was master of a lucid, vivid, and impressive style as a writer; and was remarkably agreeable in conversation. See *Life and Times of Samuel Bowles*, by George S. Merriam (1885).—His son, SAMUEL B., third (b. Springfield, Mass., 1851, Oct. 15) assumed the proprietorship of the *Republican* on his father's death, and has held it since.

BOWLES, WILLIAM AUGUSTUS: adventurer: 1763—1805, Dec. 23; b. in Frederick co., Md. At the age of 13 he entered the Brit. army, then occupying Philadelphia; was commissioned; dismissed; joined the Creek Indians, and married an Indian squaw. He instigated the Creeks in many outrages on the colonists. After the war he was a continual mischief-maker among the Indians. He greatly annoyed the Georgia settlers; and preyed upon the Spaniards so that they offered \$6,000 reward for his capture. In 1804 he was betrayed to them; and died a prisoner in Moro Castle, Havana.

BOWLES, *bōlz*, WILLIAM LISLE, D.D.: 1762, Sep. 24—1850, Apr. 7; b. King's Sutton, Northamptonshire, where his father was then vicar: English poet. He received his education at Winchester School, and at Trinity College, Oxford, and became at last a prebendary of Salisbury Cathedral, 1803, and rector of Bremhill, Wiltshire, 1805. Here he spent, in comparative affluence, the remainder of his life of nearly 88 years, which ended at Salisbury. His poetical career began with the publication, 1789, of *Fourteen Sonnets, written chiefly on Picturesque Spots during a Journey*. This unpretending little volume was received with extraordinary favor; the sonnets were fresh and natural, and to many minds, all the more charming because of the contrast which they presented to the style of poetry which had long been prevalent. Coleridge, Wordsworth, and Southey were among their enthusiastic admirers; and, through the influence which he exercised over them, B. may be regarded as the founder of a school of English poetry, in which their names soon became greater than his own. The subsequent poetical works of B. are very numerous, of which *The Spirit of Discovery* and *The Missionary* are generally regarded as the best of his longer blank verse poems. As a poet, B. shows fine appreciation of the beau-

BOWLING GREEN—BOWLS.

ties of nature, and pleases by the expression of pure and generous sentiment, as well as by playfulness of fancy and perfect scholarly correctness, but he is greatly deficient in vigor and depth. He published an edition of Pope's works 1807; and an opinion which he expressed on the poetical merits of Pope, led at a subsequent period to a rather memorable controversy, in which Campbell and Byron were his antagonists, and which turned chiefly upon the comparative value in poetry of images derived from nature and those derived from art. B. was generally admitted to have discomfited his opponents. He frequently employed his pen in defense of the Church of England, and endeavored to vindicate all the peculiarities of the older English educational institutions. Of his prose writings may be mentioned a volume of sermons (Lond, 1826), and a rather dry *Life of Thomas Ken, deprived Bishop of Bath and Wells* (2 vols., Lond. 1830-1).

BOWLING GREEN, *bō'ling grēn*: town, the seat of justice of Warren co., Ky., at the head of steamboat navigation of the Barren river, about 20 m. s. e. of Woodbury, 120 m. s.w. of Frankfort, 71 m. n. by e. of Nashville; on the Louisville and Great Southern railroad—one branch of which connects it with Nashville and the other with Memphis. It has 3 banks, a college, a Rom. Cath. academy, about a dozen churches, several weekly newspapers, gas-works, water-works, and some manufactures. Pop. (1870) 4,574; (1880) 5,114; (1890) 7,790; (1900) 8,226.

BOWLS, GAME OF: favorite pastime throughout the British Isles; played upon a smooth, flat piece of turf, from 40 to 60 ft. square, surrounded by a trench or ditch about half a foot deep. The players arrange themselves in sides, usually of four each, and each man is usually provided with two bowls. The bowls are made of lignum-vitæ wood, of 6 or 8 inches in diameter, nearly round and with a bias to one side. A smaller ball, perfectly spherical, and white, is placed at one end of the bowling-green; this is termed the *jack*; and the aim of the players, who stand at the other end of the green, is to send their B. that they may lie as near as possible to the jack. The side whose B. are nearest the jack reckon one point for each bowl so placed. 7, 14, 21, or 31 make game, according to mutual arrangement beforehand. B. are biased or weighted on one side, that the player may reach the jack by a curved instead of a straight course, an expedient which the nature of the game renders particularly desirable. Indeed, were it not for this, the game would lack half its charms. A bowl is played *fore-hand*, when it is so placed in the hand and delivered as to cause it to approach the jack with a curve from the right; and in order to attain this curve, the bowl must be held so that its bias is on the left or in-side. Backhand is the reverse. If a bowl goes into the ditch without touching the jack, it cannot count in the scoring of that end; but if it strikes the jack, and then rolls into the ditch, it reckons as if on the green. When the jack is carried by a bowl into the ditch, it is usually lifted, and placed on the green as

BOWMAN.

near as possible to its position in the ditch. When the B. have so accumulated round the jack, that it is impossible to approach it from either *side*, without running the risk of touching an adversary's bowl, the last player frequently endeavors to *run* the jack, by playing straight at it with such force as to neutralize the bias, and, if fortunate, carry away the jack from the neighborhood of his opponent's bowls. A *skip* is appointed on each side, whose duty it is to direct each of his men.—For BOWLING at cricket, see CRICKET.

The game of B. was, anciently, unlawful, and was the subject of prohibitive legislation in England in the reign of Henry VIII.; but the law then enacted was repealed 1845.

BOWMAN, *bō'man*, THOMAS, D.D.: bishop of the Meth. Episc. Church: 1817, July 15—————; b. near Berwick, Columbia co., Penn. He graduated at Dickinson Coll., Carlisle, Penn., 1837; was licensed to preach in the Meth. Episc. denomination 1838, and had a traveling connection 1839. He taught in the grammar school of Dickinson Coll. 1840–48. From 1843–48 he acted as a supernumerary on account of ill health. From 1848–58 he was principal of Dickinson Seminary, Williamsport, Penn., at the same time becoming noted for pulpit eloquence. He was pres. of Indiana Asbury (now De Pauw) Univ., Greencastle, Ind. 1858–72; and was made bp. 1872. He was chaplain of the U. S. senate 1864–5, and was made chancellor of De Pauw Univ. 1884.

BOWMAN, Sir WILLIAM PAGET, M. D., LL. D., Bart., 1816, July 20—1892, Mar. 28; b. Nantwich, England. He received a medical education at King's Coll., London, and entered into general practice in that city, but gradually became a specialist in diseases of the eye, and achieved high reputation in this department. He was first pres. of the Ophthalmological Soc. of the United Kingdom, and received the royal medal in physiology from the Royal Soc. 1842. He was hon. sec. of the Royal Institution of Great Britain for 3 years, and corr. mem. of many European scientific bodies. He received the hon. degree M. D., Dublin 1867; LL. D., Cambridge 1880; and LL. D., Edinburgh 1881; and was created a baronet 1884. He published several important works in his specialty: *Lectures on the Parts concerned in the Operations of the Eye*; *Observations on Artificial Pupil*; *Physiological Anatomy and Physiology of Man*; etc.

BOWNE—BOWRING.

BOWNE, **BORDEN PARKER**, LL. D.: educator: 1847, Jan 14—————; b. Leonardville, N. J. After graduating at the Univ. of New York, 1870 he went to Germany, and studied at Halle and Göttingen. In 1876 he was appointed prof. of philosophy in the Boston Univ., and has continued to occupy that chair. B. has become eminent in his dept., making frequent contributions to the literature of philosophy, particularly in regard to the relation of ethics to religion. His writings include *The Philosophy of Herbert Spencer* (1874); *Studies in Theism* (1879); *Metaphysics* (1882); and *Introduction to Psychological Theory* (1886); *Philosophy of Theism* (1887); *The Principles of Ethics* (1892).

BOWRING, *bow'ring*, Sir **JOHN**: 1792, Oct. 17—1872; b. Exeter: English politician, linguist, and author. He early applied himself to the study of languages, in the acquisition of which he showed unusual talent. The national poetry of different peoples had particular attractions for him, and he rendered great service to literature by collecting and translating the ancient and modern popular poems of almost all the countries of Europe. His translations preserve remarkably well both the meaning and the spirit of the original and evince good powers of versification. B. was intimately associated with Jeremy Bentham, who appointed him one of his executors and intrusted him with the editing of his collected works. Of Puritan descent he early came forward in writing and speaking against the political disadvantages experienced by dissenters. He took part from the first in the *Westminster Review*, established 1824, and edited it for about five years from 1825. In 1828 he visited Holland and his letters—in the *Morning Herald*, and shortly afterward translated into Dutch—procured for him the degree of Doctor of Laws from the Univ. of Groningen. Subsequent travels were undertaken by him, on a commission from the British government, to inquire into the commercial relations of certain states. He visited Switzerland, Italy, Egypt, Syria, and finally the countries of the German Zollverein, and everywhere found materials for valuable reports. He was a member of the house of commons, 1835–37 and 1841–49, and actively promoted the adoption of free trade. In 1849 B. was appointed British consul at Hong-Kong, and superintendent of trade in China. He returned, 1853, and in the following year was made knight and gov. of Hong-Kong. In 1856, an insult having been offered to a Chinese vessel, said to have been under the protection of the British flag, B., without consulting the home government, ordered an attack on certain Chinese forts, a proceeding which excited considerable dissatisfaction in the country and produced a ministerial crisis. B. afterward returned to England. In 1855 he concluded a commercial treaty with Siam and gave an interesting account of his visit in a work entitled *The Kingdom and People of Siam*. He retired on a pension, 1859, and 1861 was sent on an official mission to Italy. His *Autobiographical Reminiscences* were pub. 1877.

BOWS—BOW-WOW.

BOWS, n. plu. *bowz*: see under Bow 2.

BOWSE, v. *bowz*, among *seamen*, to pull or haul hard. BOWS'ING, imp. BOWSED, pp. *bowzd*. BOWSE AWAY, to pull together.

BOWSE, v.: to carouse: see BOOSE.

BOWSPRIT: large boom or spar projecting forward from a vessel under the bow.

BOW'STRING HEMP: English name, proposed by Dr. Roxburgh, and partially adopted, for the fibre produced by *Sansevieria Zeylanica*, a plant of the nat. ord. *Liliaceæ* (q.v.), tribe *Hemerocallææ*, native of the East Indies. The employment of the fibre for making bowstrings led to this name. Dr. Royle prefers the Sanskrit name MOORVA, on account of the confusion apt to be caused by applying the term hemp to a variety of fibres. The genus *Sansevieria* is distinguished by a colored, funnel-shaped perianth, with a long tube, into the throat of which the stamens are inserted, and a three-celled and three-seeded, or abortively one-celled and one-seeded, berry. The plants have a general appearance much like that of many species of *Iris*, but their leaves are more fleshy; they have a thick creeping rhizome or root-stock; the radical leaves are long and narrow, and the flowering stems have only scale-like leaves.—Very similar to *S. Zeylanica* are *S. Roxburghiana* and *S. lanuginosa*, also natives of India. These plants grow under bushes in jungles near the sea, where the soil is salt, but may easily be propagated on almost any soil by the shoots which issue in great abundance from the root-stock. They are perennial. The leaves are about two ft., or in cultivation three or four ft., long; the fibres extend their whole length; and to separate the fibres from the pulpy part of the leaves, 'the natives place them on a smooth board, then press one end of the leaf down with one of their great toes, and with a thin bit of hard stick, held between the two hands, they scrape the leaf from them, and very quickly remove every part of the pulp.' Steeping in water is also practiced, but it discolors the fibre, which is beautifully white. One pound of clean fibre is obtained from about 40 lbs. of fresh leaves. Dr. Roxburgh calculated that one acre would yield 1,613 lbs. of clean fibre at a gathering and that two gatherings might be reckoned upon annually, in good soil and favorable seasons, after the plants have reached proper age. The fibre is hair-like and silky, elastic, and in strength apparently about equal to hemp. It does not rot in water so soon as hemp. A species of *Sansevieria* very similar to the Indian ones, *S. Guineensis*, is found in abundance along a great extent of the w. coast of Africa, specimens of the fibre of which also fine and strong, have been brought to England under the name of AFRICAN BOWSTRING HEMP.

BOW-WOW, int. *bow'wow*, one of the cries of a dog: N. a familiar name applied by Max Müller to designate the theory which derives language from the direct imitation of natural sounds.

BOWYER—BOX

BOWYER, *bō'yēr* [from *bow*, as *lawyer*, from *law*]: in *OE.*, one who uses the bow; an archer; a maker of *bows*.

BOWYER, *bō'yēr*, **WILLIAM**: 1699–1777; b. London: English printer and classical scholar. He was educated at Cambridge, and in 1722, joined his father in trade. Appointed, 1729, printer of the votes of the house of commons, he subsequently became printer to the Soc. of Antiquaries and to the Royal Soc. In 1767, he was nominated printer of the Rolls of the house of lords and the Journals of the house of commons. B. published several philological tracts, but his chief production was an edition of the New Testament in Greek, with critical and emendatory notes. He left a considerable sum in trust to the Stationers' Company for relief of decayed printers. See *Literary Anecdotes of the Eighteenth Century* (9 vols., 8vo).

BOX, *n.* *bōks* [AS. *box*; Gr. *puxis*; Ger. *büchse*, a box: Gr. *puxos*; L. *buxus*, a box-tree—*lit.*, an article or hollow vessel made of boxwood]: a case or hollow vessel of any size and shape, and made of any material; a seat separated from others; a shrub having a fine close-grained wood—the *Buxus sem'pervirens*, ord. *Euphorbiacæ*: V. to inclose. **BOXEN**, *a.* *bōk'sn*, made of boxwood; resembling boxwood in color. **BOXING THE COMPASS**, rehearsing the points, half-points, and quarter-points of the mariner's compass in their order; one of the lessons which a young sailor has to learn. **IN THE WRONG BOX**, mistaken; out of one's proper place. **IN A BOX**, in an embarrassing position; in a difficulty. **BOX OF A COACH**, the driver's seat on a carriage. **BOX-DAYS**, in the Scotch court of session, two days in the spring and autumn vacations respectively, and one day in the Christmas recess, during which, according to an order of the court of session, 1690, Nov. 29, pleadings may be filed—that is, placed in a *box* through a slit: see **BILL-CHAMBER: COURT OF SESSIONS**: and other **COURTS**. **BOXING-DAY**, the day after Christmas-day, or box-day, on which Christmas-boxes are given to servants and others: see **CHRISTMAS-BOX**. **BOX-HAULING**, a particular mode of turning a ship, when the swell of the sea renders tacking impossible, or when the ship is too near the shore to allow room for veering. The operation is effected by a peculiar management of the helm and the sails. *Boring-off* is an operation very similar to box hauling: see **TACK: VEER**. **BOX-IRON**, a hollow smoothing-iron, heated by a hot iron within. **BOX-KEEPER**, one who has charge of the inclosed seats or boxes at a theatre. **CHRISTMAS-BOX**, a present at Christmas, generally in money.

BOX, *v.* *bōks* [Dan. *bask*, a sounding blow; *baske*, to slap: Gael. *bosag*, a slap, as on the cheek—from *bos*, the palm of the hand; *boc*, a blow]: to fight with the hands or with clenched fists; to strike: N. a blow with the hands or with clenched fists. **BOX'ING**, *imp.*: N. the act of fighting with the fists. **BOXED**, *pp.* *bōkst*. **BOX'ER**, *n.* one who fights with his fists. **BOXING-GLOVE**, padded gloves used in learning the art of boxing and in sparring. **BOXING-MATCH**,

BOX.

a fight with fists or with boxing-gloves; a pugilistic encounter. See PUGILISM.

BOX (*Buxus*): genus of plants, nat. ord. *Euphorbiaceæ*; evergreen shrubs or small trees, with opposite leaves, entire at the margins and easily split into two plates. The greenish inconspicuous flowers grow in little axillary clusters, the male and female flowers distinct but on the same plant. The male flowers consist of a perianth of four leaves and of four stamens; the female flowers have a perianth of three or four leaves, and in addition three small bracts at the base, an ovary surmounted by three styles and two honey-secreting glands. The capsule has three beaks and three cells, and two or three black seeds in each cell.—The most important species is the COMMON BOX (*B. sempervirens*), which grows wild in the s. of Europe and in some parts of Asia. It is generally re-



Common Box.
b, a, female flower.

garded as a true native of the s. of England, where it grows on dry, chalky hills, and is remarkable as the only arborescent species of *Euphorbiaceæ* found in such cold latitudes. In Britain it seldom attains a height of more than 12 or 14 ft., but in warmer countries it is often twice that height. Its leaves are oval, generally from half an inch to three-quarters of an inch in length, smooth and shining, of a deep green color. The box is remarkable for its compact habit of growth and densely crowded branches and leaves, presenting a very solid mass of foliage. There are several cultivated varieties, distinguished by differently variegated leaves—gold-edged, silver-edged, etc. The most interesting variety, however, is a very humble one, called DWARF BOX, which grows only to a height of two or three ft. and of old commonly used in the United States and in Europe to form edgings for garden-plots, being kept down by clipping to the height of a

BOX-ELDER.

few inches. These edgings are formed usually by planting cuttings, which readily strike root. The box bears clipping remarkably well; and in a style of gardening once fashionable, but condemned by the taste of the present day, it occupied an important place, being cut into architectural and fantastic figures. The leaves of the box have a smell which is disagreeable to some people, and a very disagreeable bitter taste. When taken inwardly they cause purging; an external application of them promotes the growth of the hair. In France they are sometimes used instead of hops in making beer, but are extremely improper for the purpose. The wood of the box is heavier than that of any other European tree, and is the only European wood that sinks in water. It is of a beautiful pale-yellow color, remarkably hard and strong, of a fine regular and compact texture, capable of a beautiful polish, and not liable to be worm-eaten. It is much valued for the purposes of the turner and the wood-carver; is preferred to every other kind of wood for the manufacture of flutes, flageolets, and other wind-instruments, as well as of mathematical instruments, and is unrivalled for wood-engraving, admitting of a finish as sharp and fine as metal, while it *takes the ink* much better. See ENGRAVING. When scraped down and boiled it can be used as a sudorific in many complaints, and as a substitute for guaiacum. An empyreumatic oil, obtained from box-wood chips, is used for relief of toothache and for other medicinal purposes. Spain and Portugal send into the market large quantities of box-wood; also Circassia and Georgia, from which countries it finds its way to Odessa, and is again exported thence. In 1815, as many box-trees were cut down at Box Hill, in Surrey, as brought upward of £10,000, but the tree is of so very slow growth that it is seldom planted in Britain except for ornament. The MINORCA Box, or BALEARIC BOX (*B. Balearica*), a native of Minorca, Sardinia, Corsica, Turkey etc., is a larger tree than the common box and has leaves three times as large. It is much less patient of frost, but is occasionally seen in shrubberies in the s. of England. The wood is of a bright yellow and inferior to the true box-wood, but is brought in large quantities from Constantinople under that name, for wood-engraving.

BOX-ELDER, or ASH-LEAVED MAPLE: the *Negundo aceroides*, a handsome, rather small tree, common along streams from Pennsylvania s. and west. In some parts of the northwest, sugar is manufactured from it. A variety having white variegated leaves is cultivated for ornament. The native green tree is much used for shade at the west. It has rich green foliage, light green twigs, compact form, and a toughness that resists violent winds; the fruit forms drooping clusters of large winged seed. Its name elder is unfortunate, as it is a maple, and does not belong to the family in which the elder (*Sambucus*) is placed.

BOXERS—BOYAR.

BOXERS : members of a Chinese secret society which aims ostensibly at the expulsion of foreigners from China. The origin of the Boxers appears to have been due to fanatic opposition to Christian missionaries and to the encroachments of European powers upon Chinese territory. Early in 1900 the native population in Shantung were found to be rallying around the standard of the Boxers and adopting its motto, "Uphold the dynasty, drive out the foreigners." The diplomatic corps at Peking called upon the imperial government to suppress the movement. This the court professed its readiness to do, although there was a suspicion voiced by the British minister that the Empress Dowager had fallen under the influence of a native party led by Tung Fu-hsiang and Yu-hsien, and was temporizing with the Boxers. In 1900, May, the Boxers began a concerted movement upon the Chinese capital which, notwithstanding the protests of the diplomatic corps, remained unchecked by the military forces of the empire. In 1900, June, Peking was reduced to a state of siege by the Boxers. The position of the foreigners in the capital became precarious. The entire diplomatic corps was cut off from communication with the outside world. In the emergency the powers hurried military and naval forces to the scene, and an international relief column, under the command of Admiral Seymour of the British navy, moved upon Peking. This force was, however, compelled to retreat, when a short distance beyond Tien-Tsin, with a loss of 300 men. The position of the capital now became desperate. Cut off from communication with the rest of the world, Peking was a scene of turbulence and the centre of wild rumor. It was reported that on July 7 the entire diplomatic corps had fallen a prey to Boxer fury. The movement had spread in all directions among the Chinese, who, on July 16, invaded Siberia. Russia at once proclaimed a state of siege in its Asiatic dominions. The powers did not, as yet, give formal recognition to a state of war, chiefly in consequence of the attitude of the U. S., which took the ground that the Chinese government had been overpowered by an insurrectionary movement. On July 20 the powers made a categorical demand to be placed in communication with their diplomatic representatives. The authorities at Peking professed their readiness to comply at the earliest possible moment. See CHINA.

BOYACA, *bō-yá-ká'*: town of the U. S. of Colombia, near which, 1819, Bolivar, by a victory over the Spaniards, secured the independence of Colombia. It gives name to the dept., which stretches from the plateau of Bogota to the borders of Venezuela, being watered by the Magdalena, Sogamozo, Zulia, Cazanare, and Meta rivers. The capital, however, is not B. itself, but the neighboring city of Tunja about 70 m. n.n.e. of Bogota.

BOYAR, n. *boy'ár*, a Russian nobleman: see BOIAR.

BOYAU, n. *boy'ō*, **BOYAUX**, n. plu. *boy'ōz* [F. *boyau*, a bowel, a long and narrow place]: in *fort.*, a ditch covered with a parapet, serving as a communication between two trenches; zigzag trenches to enable besiegers to approach a town.

BOY-BISHOP—BOYCOTTING.

BOY-BISHOP: a boy elected on St. Nicholas's Day, in a strange semi-farcical, semi-solemn imitation of the ecclesiastical prelate, according to a custom dating from a very early period. Warton thought he could find some allusion to it in one of the anathemas of the Constantinopolitan Synod, A.D. 867. It quickly spread over most Rom. Cath. countries, and in England seems to have prevailed in almost every parish. Although the election took place on St. Nicholas's Day (Dec. 6), the authority lasted to Holy Innocents' Day (Dec. 28). The B. was chosen from the children of the church or cathedral choir, or from the pupils at the grammar-school. He was arrayed in episcopal vestments, and, attended by a crowd of subordinates in priestly dress, went about with songs and dances from house to house, blessing the people, who, as Bishop Hall says, 'stood grinning in the way to expect that ridiculous benediction.' The B. exacted implicit obedience from his fellows, who, with their superior, took possession of the church, and performed all the ceremonies and offices except mass. The custom found countenance not among the populace only. In 1299, Edward I., on his way to Scotland, permitted a B. to say vespers before him at Heton, near Newcastle-on-Tyne, and gave him and his companions a present. At Salisbury—and perhaps in other places also—the B., it is said, had the power of disposing of such prebends as happened to fall vacant during the days of his episcopacy; and, if he died during his office, the funeral honors of a bishop, with a monument, were granted him. What secular shows and entertainments accompanied this practice, history does not inform us. Probably dramatic exhibitions of a rude nature were the principal. In England, the custom of electing a B. was abolished by a proclamation of Henry VIII., 1542, July 22; restored by Queen Mary 1554; and again abolished during the reign of Elizabeth, though it seems to have lingered here and there in villages till about the close of her reign.

BOYCE, *boys*, WILLIAM, Mus. Doc.: 1710–79; b. London: English composer. He was instructed by Dr. Greene, and became organist to the Chapel Royal 1758. His best productions are: a *Te Deum*, six anthems; *Collection of Cathedral Music*; *The Cathedral Music of the English Masters of the Last Two Centuries* (1760, 3 vols. folio); Solomon; and the grand anthem, *Lord, Thou hast been our Refuge*.

BOYCE, JAMES PETIGRU, S.T.D., LL.D.: Baptist minister: 1827, Jan. 11—1888, Dec. 28; b. Greenville, S. C. Having graduated at Brown Univ. 1847, and Princeton Seminary 1851, he was ordained pastor of a Bapt. chh. in Columbia, S. C. He was prof. of theol. in Furman Univ., Greenville, 1855–58; and then in the Southern Bapt. Theol. sem. in Greenville, which received large endowments from Baptists in Ky., to which was added a liberal donation from Prof. B., and 1873 the institution was removed to Louisville, Ky. B. then was chosen its pres. and held that office till his death in Pau, France.

BOYCOTTING: English word familiarly expressing exclusion from social or business intercourse. It signifies

also intimidation by threatening to exclude from such intercourse. B. has been practiced frequently in Ireland and in the United States; as in Milwaukee when the brewers withheld their business patronage from the merchants who favored the observance of the Sunday laws; and during the labor troubles in this country, 1886, 7, and 1888, Feb., in the mining region of Pennsylvania. When the method is by conspiracy, libel, or blackmail, with the intent and actual effect of injuring others in business or reputation, the offense is punishable in the law courts. It has been held by the U. S. circuit court that boycotting Chinamen is a violation of the constitution of the United States, and of our treaties with China. Much public interest was excited in New York, 1886, by Mrs. Gray's case and the Theiss case, both of which were decided against the defendants. See CONSPIRACY: TRADE UNION.

The word is from *Boycott*, the name of an agent in Ireland of Lord Erne's Lough Mask estate. He made himself extremely unpopular with his tenants by burdensome fines, and by evicting many for non-payment of rent. Advised by the Land League, the tenants and their neighbors resolved that they would have no intercourse with him or his family, and would not work for him or trade with him, or allow others to do so. Abandoned by his farm-servants, shepherds, post-boy, laundresses, smiths, grocers, and tradesmen, and with his crops rotting in the ground, his only hope was aid from a distance. The Orangemen of Ulster responded, and, protected by a thousand soldiers, gathered his farm produce. He and his family were then conveyed in a guarded ambulance to Claramorris, whence, on the following day, they went to London. B. had some acquaintance with books, but was violent and unreasonable in temper, and seems to have deserved the social outlawry he suffered. Yet such a mode of discipline cannot be commended for common practice.

BOYD, ANDREW KENNEDY HUTCHISON, S.T.D. LL.D.: Presbyterian minister and author: 1825, Nov.—1899, Nov. 2; b. Auchinleck, Scotland. He was educated at King's Coll., London, and at Glasgow Univ., where he graduated with the highest honors in philosophy and theology 1846. Ordained minister of the Chh. of Scotland 1851, he was incumbent successively of the parishes of Newton-on-Ayr, Kirkpatrick-Irongray, St. Bernard's (Edinburgh), and of the Univ. city of St. Andrews. He is author of three series of *The Recreations of a Country Parson*, which have had very large circulation, especially in the United States. His style is lucid and racy, and his thought is practical. Several vols. of his sermons have been pub. under the titles, *Graver Thoughts of a Country Parson*; *Counsel and Comfort Spoken from a City Pulpit*; etc.; also his reminiscences, *Twenty-five Years of St. Andrews* (2 vols. 1892). B. was elected moderator of the Scottish Chh. gen. assembly 1890.

BOYD, ZACHARY: eminent Scottish divine: born before 1590; d. 1653 or '4: educated at Kilmarnock, and at the universities of Glasgow, and Saumur in France, of which

BOYDELL—BOYDEN.

latter he was, 1611, appointed a regent or prof., and is said to have declined the principalship. The persecutions of the Protestants in France caused him to return to Scotland 1621. In 1623, he became minister of the Barony parish, Glasgow, and was thrice elected rector of the univ. of that place. His principal prose work, *The Last Battell of the Soule in Death*, published at Edinburgh, 1629, in two vols., was reprinted, with a life of the author, by Gabriel Neil, Glasgow, 1831. He was author of 18 other works, chiefly religious. The third edition of his *Psalmes of David in Meeter* appeared at Glasgow, 1646. At his death he left numerous MSS. and his library, with a considerable legacy, to the College of Glasgow, over the court gateway of which is his stone bust, while his portrait is in the Divinity Hall of the same univ. Among his MSS. is a collection of quaint poems on Scriptural subjects, entitled *Zion's Flowers* usually called Zachary Boyd's Bible; its style is amusingly homely.

BOYDELL, *boy'děl*, JOHN: 1719–1804, Dec.: liberal patron of art in England. At the age of 21 he apprenticed himself for seven years to an engraver in London, and on the expiration of his apprenticeship, published, by subscription, a series of views in England and Wales, with the profits of which he set up a print-selling business in the metropolis. English engraving was at a low ebb; but under B's liberal patronage of native artists, the importation of prints nearly ceased, and English prints were exported to the continent. B., seeking to do for English painting what he had done for engraving, selected Shakespeare's works for illustration; and secured the most eminent painters in the kingdom, including Opie, Reynolds, Northcote, and West: the result was the magnificent 'Shakespeare Gallery,' from which was engraved a superb volume of plates (Lond. Boydell, 1803). B. published also a splendid edition of Shakespeare's works, 9 vols. fol. (1792–1801). The immense cost of the Shakespeare illustrations, and the commercial depression consequent on the French Revolution, brought him into some financial difficulties in his last years.

BOYDEN, SETH: 1788–1870; b. Foxborough, Mass.: inventor. He spent his boyhood in working on the farm and at study in the common school. His leisure time was spent in the blacksmith's shop; and, at the age of 21, he had constructed, after his own invention, machines for cutting files and making nails. He also invented improvements on leather-splitting machines, substituted the straight axle for the crank in locomotives, and introduced a cut-off connected with the governor in place of the throttle valve. Others reaped the profits of his inventions, and he, like many other benefactors, remained poor to the end.

BOY'DEN, URIAH AThERTON: inventor: 1804, Feb. 17–1879, Oct. 17; b. Foxborough, Mass.; bro. of Seth B. In early life he learned the blacksmith's trade; later was a civil engineer constructing railroads; then turned to hydraulic engineering and made important improvements in

BOYER.

turbine water-wheels. From 1850 he applied himself to the study of chemistry and physics in Boston. He established a soldiers' memorial building in Foxborough, and gave \$1,000 to the Boyden Library there, and placed with the Franklin Institute (Philadelphia) \$1,000 to be awarded to the resident of N. America who should experimentally determine whether all forms of radiant energy are transmitted with the same velocity.

BOYER, *bwâ-yâ'*, ALEXIS, Baron DE: 1757, Mar. 30 (or 1760)—1833, Nov. 25; b. Uzerche, Limousin: French surgeon of the greatest eminence. He was for some years in the service of a notary before he began his medical studies. In 1787, he was appointed second surgeon to the Hôpital de la Charité at Paris, and afterward prof., first of operative surgery, then of clinical surgery, at the École de Santé. In 1804, he was appointed first surgeon to the emperor, who raised him to the rank of baron. He accompanied the emperor on his campaigns and journeys. After the Restoration B. became prof. of practical surgery in the Univ. of Paris, and first surgeon at the Hôpital de la Charité. In 1823, he was appointed consulting surgeon to the king; and 1825, was admitted a member of the Institute. His greatest works are his *Traité Complet d'Anatomie*, 4 vols. (Par. 1797-99, and other editions), and his *Traité des Maladies Chirurgicales et des Opérations qui leur conviennent*, 8 vols. (Par. 1814-22). From 1798 to 1817, he was engaged with Roux and Corvisart in conducting the *Journal de Médecine, Chirurgie et Pharmacie*.

BOYER, JEAN PIERRE: president of the republic of Hayti: 1776, Feb. 2—1850, July; a mulatto, b. at Port-au-Prince, cap. of that part of the island then belonging to France. At a very early age he was sent to France, where he received a European education, and in 1792, entered the military service and fought against the British on their invasion of his native isle. He soon joined the party which sought the complete emancipation of the colony. B., with Péthion, assisted Christophe to overthrow the bloody negro tyrant Dessalines 1806, but deserted Christophe when he attempted to make himself sovereign. Péthion established an independent republic in the w. part of the island; and B. was invested by the new president with the command of the capital, Port-au-Prince, and the rank of maj.gen., in which position B. showed much military and administrative capacity, and was recommended by Péthion, when dying, as most worthy to be his successor; and was unanimously elected pres. of the republic. He arranged the finances, collected funds, improved the administration, and encouraged education. After the death of Christophe, he united the monarchical part of the island with the republic in 1820; and in 1821, the e. district also, which had remained under the dominion of Spain; and he obtained recognition of the independence of the youthful state by France 1825, on payment of an indemnity of 150 millions of francs. . B. carried on the government of the republic of Hayti for 15 years, from this time in peace; but his policy was arbitrary

BOYESEN—BOYLE.

and tended to depress the negroes in favor of his own race (the mulatto); and an insurrection 1843 caused B's flight to Jamaica, whence he announced his resignation to the Haytian revolutionary committee, and consigned himself to a voluntary ostracism. See HAYTI. B. died in Paris. He was a man of great perseverance, and of captivating manners; but artful, and often harsh and cruel to those under him.

BOYESEN, *boy'è-sèn*, HJALMAR HJORTH: author: 1848, Sep. 23—1895, Oct. 4: b. Fredericksvoern, Norway. He was educated in the Christiania Gymnasium, the Univ. of Leipsic, and the Univ. of Norway. After graduating 1869, he emigrated to the United States, and was editor of a Scandinavian journal in Chicago till 1874, when he became prof. of German in Cornell Univ. Since 1880 he has held a like chair in Columbia Coll. He quickly acquired perfect mastery of English, and is author of many admirable tales, sketches, and essays, and has translated several stories from the Norwegian. Among his tales and romances are: *Gunnar—a Norse Romance*; *Falconberg*; *A Daughter of the Philistines*; *The Mammon of Unrighteousness*; *The Light of Her Countenance*. The *Story of Norway* is a children's history. In *Essays on German Literature* his chief themes are the different phases of the genius of Goethe and Schiller, evolution of the German novel, influence of the romantic school.

BOYLE, *boyl*: town in Roscommon co., Ireland, in a picturesque vailey on both sides of the Boyle, one m. above its expansion into Lough Key, and 8 m. n.w. of Carrick-on-Shannon. It has a large trade in corn and butter. Latin and English annals of B. date from 420 to 1245, and have been published. An abbey was built here in the 12th c., and was reduced to its present ruined state 1595 by the Earl of Tyrone. Pop. of B. (1891) 3,347.

BOYLE, CHARLES, fourth Earl of Orrery: 1676, Aug.—1731; b. Chelsea. Entered Christ-Church, Oxford, in his 15th year. He was the nominal editor of a work on the *Epistles of Phalaris*, which was the work chiefly of his tutors, Drs. Atterbury and Friend. This publication brought on the 'Battle of the Books' (1695–98), with the result that the unfortunate B. was a victim, with his coadjutors, of Bentley's merciless criticism (see BENTLEY). In honor of B. the name 'Orrery' was given to the scientific apparatus of that name by its inventor, to whom B. had been kind. He fought as maj.gen., at Malplaquet, held court appointments, and wrote literary pieces. Of his poems, Sir Richard Blackmore said:

After his foolish rhymes, both friends and foes
Conclude they know *who did not write his prose*.

BOYLE, RICHARD, Earl of Cork, founder of the house of Cork and Orrery, styled the Great Earl of Cork: 1566–1644; b. Canterbury, Eng., of a good but not wealthy family. At the age of 22, after having studied at Cambridge and the Middle Temple, he went over to Ireland with a few pounds in his pocket, to hew his way to fortune. His energy, prudence, and signal capacity for gov-

ernment, received their reward. He bought estates and improved them, promoting the immigration of English Protestants, and triumphed over the envy of his enemies, making good his cause before Queen Elizabeth, and winning her favor. Due honors flowed in upon him, and at length he was knighted. In 1620, he became Viscount Dungarvan and Earl of Cork. In 1631, he was made lord high treasurer, an office which remained hereditary in his family. In his old age, the Munster rebels compelled him to gird on armor and turn his castle into a fortress. He soon raised a little army of his servants and tenants, and with an auxiliary force commanded by his four sons (and paid, when his money was spent, out of his plate-chest), the noble old earl took castles, smote the rebels, and quenched rebellion in his borders.

BOYLE, The Hon. ROBERT: 1626, Jan. 25—1692, Dec. 30; b. Lismore, Waterford, Ireland; seventh son and fourteenth child of the first Earl of Cork. As a child he was distinguished by precocity of intellect and a rare love of truth. After studying at Eton, and at home, he went to the continent for six years. On his return, 1644, he found himself in possession, by his father's death, of the manor of Stalbridge, Dorsetshire, where he resided till 1650. He took no part in political strife, but applied himself to science, particularly chemistry and natural philosophy. He was one of the first members of that association of scientific men which about that time (1645) held private meetings at Oxford and London, and some years later became better known as the Royal Soc. In 1654, he settled at Oxford. Here he experimented extensively in pneumatics, and improved the air-pump (see MARIOTTE, LAW OF). At the same time he studied theology. After the Restoration, he was urgently advised by Lord Clarendon to enter the priesthood, but declined, thinking to do better service to religion as a layman. Among the proofs which he gave of this, beside his own theological writings and Christian example, were his exertions as a director of the E. India Company for propagation of Christianity in the East, his supplying the funds for publishing Eliot's Indian Bible, his aid to the Soc. for Propagation of the Gospel in New England (originally a Puritan soc.), and his bequest for the "Boyle Lectures" (q.v.). In 1668 he removed to London, and thenceforth gave much of his time to the business of the Royal Soc. In 1680, he was chosen pres., but declined the honor. A peerage had repeatedly been offered to him, and declined. In 1688, finding his health decline, he shut himself up against all interruption, in order to husband his remaining time for the labor of repairing the loss caused by the accidental destruction of his MSS. In 1691, his health finally gave way, and, 1692, Dec. 30, he died, seven days after his beloved sister, Lady Ranelagh. B. was tall and emaciated in person, and extremely temperate in his habits, often subject to low spirits, but naturally lively and of rare conversational powers. His piety, benevolence, and charity would have made him remarkable, apart from his scientific attainments

BOYLE LECTURES—BOYNE.

and reputation. His complete works (including his very interesting correspondence), with a life by Dr. Birch, and an index, were published in 5 vols. fol. (Lond. 1744).

BOYLE LECTURES: so called from the founder, the Hon. Robert Boyle (q.v.), who settled an annual salary, charged upon his dwelling-house in St. Michael's, Crooked Lane, London, for 'some preaching minister,' who shall preach eight sermons in the year for proving the Christian religion against Atheists, Deists, Pagans, Jews, and Mohammedans, not descending to any controversies among Christians themselves. Abp. Tennison procured a yearly salary of £50, to be charged upon a farm at Brill, Bucks, instead of the original charge for the endowment. The office is tenable for three years.

The first series of lectures, *A Confutation of Atheism*, was preached, 1692, by Richard Bentley (q.v.). In 1704, Dr. Samuel Clarke preached the lectures, entitled *A Demonstration of the Being and Attributes of God*, in answer to the arguments of Hobbes, Spinoza, and their followers. In 1709, Dr. Lilly Butler lectured on *Religion no Matter of Shame*. All the lectures preached before and including 1732 were collected into a fine folio edition, 3 vols. (Lond. 1739); since that period, till recently, few of the lectures have been published. In 1846, the course of lectures was preached by the Rev. F. D. Maurice, and published under the title, *The Religions of the World*. The more eminent lecturers of recent years whose courses have been published are: Merivale, the historian (1864-5), who lectured on *The Conversion of the Roman Empire and Northern Nations*; Professor Plumptre (1866); Professor Stanley Leathes (1868-70); Henry Wace (1874-5); and G. H. Curteis (1884).

BOYLE'S FUMING LIQUOR: a concentrated solution of ammonia, saturated by a stream of hydrosulphuric acid, which, combining with it, forms the sulphide of ammonium (NH_4S). Exposed to the air, it fumes, and evolves a very disagreeable odor, resembling, but in an intensified degree, ordinary bilge or sewerage water.

BOYNE, *boyn*: river in the e. of Ireland, discharging its waters into Drogheda Bay, an arm of the Irish Sea, about 25 or 30 m. n. of Dublin. The B. rises in the Bog of Allen, and, in its course of about 65 m., passes Trim, Navan, Slane, and Drogheda, entering the sea about 3 m. below the last town. On its banks are many ruins of castles and monasteries. Vessels of 250 tons can ascend to Drogheda, and those of 70 tons 19 m. further to Navan. Its chief tributaries are the Deel, Mattock, and Blackwater. Turgesius, the Dane, sailed up the B. on a plundering expedition 838. But the B. is especially famous for the victory gained by William III. over James II., 1690, July 1 (New Style, July 12). An obelisk 150 ft. in height, erected 1836, marks the place. When William of Orange was crowned (1689, Feb. 22), as king of England—instead of his father-in-law, James II., in whose exile he was largely instrumental—the earth must have seemed to be quaking beneath him as he considered the perils of his situation,

incident to the inconstancy of political parties. A reaction soon took place in favor of the exiled king. Almost all Ireland rose in arms, and behind it appeared France and Louis XIV., who had received under his protection the fugitive monarch. After some maneuvers and delays in the campaign, the two armies finally joined battle on the banks of the B., the armies being at first on opposite sides of the river, several miles from Drogheda. The exiled Rom. Catholic king had about 30,000 men; and William III. about 36,000. Great valor was displayed by both armies. The loss in dead and wounded was not great—that of James II. being about 1,500, and of the English about 500; but the consequences were immense; and the new king became firmly established on his throne.

BOYNTON, *boyn' ton*, HENRY VAN NESS: journalist: b. West Stockbridge, Berkshire co., Mass., 1835, July 22; son of Charles B. B., a former chaplain of the U. S. house of representatives and prof. in the U. S. Naval Academy. He removed with his father's family to Cincinnati 1846; graduated at the Ky. Milit. Acad. 1858; and was retained in the faculty as prof. of mechanics and astronomy. Resigning at the outbreak of the civil war, his milit. training enabled him to render the govt. valuable assistance in organizing and drilling new regiments. He was commissioned maj. 25th O. vols. 1861, July 27; promoted lieut.col., and commanded the regt. at Chickamauga, Missionary Ridge—where he was severely wounded—and Buzzard's Roost; and brevetted brig.gen. for his heroism in the first two battles. After the war, he settled in Washington, achieved fame as a newspaper correspondent, wrote *Sherman's Historical Raid: the Memoirs in the Light of the Record: a Review Based upon Compilations from the Files of the War Office* (a criticism of Gen. Sherman's *Memoirs*, Cincinnati 1875), and headed the opposition to Pres. Cleveland's order for the return of Confederate battle-flags 1887.

BOYS, SHIPS': in nautical language, all the young or raw hands on board ship; called *boys*, without much reference to their age; but in recent times the term has taken in Britain a more precise meaning, as boys or lads are engaged as part of the crew.

In the British navy, boys were first voted for in the estimates, 1884. There were 1,000 in that year; 7,000 in 1876; 6,300 in 1878; 5,300 in 1879. The admiralty has, in recent years, made many regulations for attracting boys into the navy. Most of the seamen at present in the service entered it as boys. They enter mostly at about 14 years of age, but some as late as 18, and they are bound for 7 years. There are schools established for them at Portsmouth, Plymouth, Cork, and one or two other places. The boys are ranked in two classes, according to age and experience. See MANNING THE NAVY.

In the merchant service in Great Britain, boys are apprenticed to the ship-owners; they learn their duties by degrees, and constitute the source out of which mates, masters, and captains are ultimately supplied. By the

BOYTON—BOZRAH.

Merchant Seamen's Act of 1814, every merchant-ship was bound to take a certain number of boys as apprentices, according to tonnage; the better hands were apprenticed by their friends; the worst were picked up by the Marine Society from the poor and wretched of the streets, and apprenticed as a means of setting them up in life. The indenture was from 12 to 18 months.

In the United States, training ships and school ships serve a purpose somewhat similar.

BOYTON, *boy'ton*, PAUL: swimmer: b. Dublin, Ireland, 1848, June 29. He served in the U. S. navy 1863-65; gained some experience in submarine diving; was in the life-saving service on the Atlantic coast 1867-69; enlisted as a *Franc-tireur* in the Franco-Prussian war 1870-1; visited the s. African diamond-fields; returned to the United States, and organized a life-saving brigade to operate during the bathing season at Atlantic City, N. J. With his patent rubber life-saving dress, he crossed the British Channel in 24 hours 1875, May 28; paddled on the Rhine from Basel to Cologne, 430 m., 1875, Oct.; went 460 m. down the Danube in six days 1876, May; traversed the chief rivers of Europe, and crossed the Straits of Gibraltar. In America he paddled from Oil City, Penn., to the mouth of the Mississippi, 2,342 m., in 80 days, and in 1879 crossed from Long Branch to Manhattan Beach, and descended the Connecticut river from Canada to the Sound. During 1881, Sep. 17—Nov. 20, he made a voyage down the Missouri from Montana to St. Louis, 3,580 m., and 1888 made a floating voyage down the Ohio river. He published *Roughing It in Rubber* (1886).

BOZEMAN, *bōz'man*: city, cap. of Gallatin co., Mont.; on the e. Gallatin river and the Northern Pacific railroad; 98 m. s. by s.e. of Helena. It is in an agricultural and stock-raising country, with rich mines of gold, silver, coal, iron, and argentiferous galena in its immediate vicinity. It contains 7 hotels, 2 opera-houses, 7 public halls, public library, 2 public and 2 private schools, B. Collegiate Institute, U. S. land office, 6 churches, 2 national banks (cap. \$150,000), 2 flour-mills, 3 planing-mills, and a costly system of irrigation. Three newspapers are published. There are daily stages to Red Bluff, Meadow Creek, Ennis, and Virginia City. Pop. (1890) 2,143.

BOZRAH, *boz'rah*, or Bos'TRA: very ancient city of Syria, pashalic of Damascus, 76 m. s.s.e. of Damascus, on a tributary of the Jordan. When viewed at a distance B. presents an imposing aspect, the magnificent castle, the mosques, minarets, old ramparts, and the large masses of buildings indicate an active population; but as one approaches the illusion is dissipated. The surrounding country lies uncultivated, the walls tumbling down, the mosques without roofs, the houses ruined to their foundations, and one must grope far before reaching five or six families, which constitute the whole population of the present B. Although very ancient B. is not mentioned in

BOZZARIS—BOZZOLO.

history until the time of the Romans. Under Trajan (105) it was made the metropolis of the province of Arabia, and took the name of *Nova Trajana Bostra*, which we find upon the medals of that epoch. The Emperor Philip the Arab, who ascended the throne 245, was born at B. He added to the adornments of his natal city, which was later the seat of a bishopric. Its decline dates from the Mussulman conquest; its complete ruin from the crusades in 1180, when it was ravaged by the Turks. Some claim, however, that B. was still a populous place in the 14th c.

In Idumæa (Edom) at the s. of Palestine, on the route from Hebron to Petra, there was another B., regarded as the cap. of that country.

BOZZARIS, *bot'sâ-ris*, MARCOS: Greek patriot in the early part of the modern war of independence: born Suli, in the mountains of Epirus, toward the close of the 18th c.; d. 1823, Aug. 20. His youth was spent amid the din of arms. In 1803 he was forced to retreat to the Ionian Isles, by Ali Pasha (q.v.), who, in a series of bloody combats, had nearly exterminated the Suliotes. In 1820, two events occurred which called forth his patriotic energies: Hypsilanti summoned the Greeks to insurrection, and war broke out between Ali Pasha and the sultan. On learning the news, B. put himself at the head of some 800 expatriated Suliotes, and passed over into Epirus. Ali, who dexterously endeavored to identify his cause with that of the Greeks, soon found means to secure B.'s services against their common enemy, the sultan. B. obtained several victories, and on the death of Ali at the taking of Janina, 1822, he continued the war successfully against Khurshid Pasha, the Turkish general. Shortly afterward Prince Mavrocordato landed at Mesolonghi, with a body of disciplined troops, and being joined by B., he engaged the Turks at Petta, 1822, July 16. Through treachery the Greeks were overpowered, their best soldiers perished, and B., with Mavrocordato, was compelled to retire to Mesolonghi. This place he skilfully defended against the Turks, until a Hydriote fleet forced them to retire. In the summer of 1823, a Turco-Albanian army of 20,000 men, under the command of the Pasha of Scodra, descended from the n. of Epirus. B., who knew that the fortifications of Mesolonghi were too weak to withstand an assault, determined to surprise his enemies by a sudden blow. He advanced swiftly at the head of 1,200 men, and on Aug. 20 reached Kerpenisi, where the van of the Turco-Albanian army, 4,000 strong, was encamped. At night, the Suliotes burst in upon their startled foes, who were routed with great slaughter. The victors captured their camp, standards, and a vast quantity of baggage. This triumph was saddened by the loss of the heroic B., who fell while leading on his men to the final attack. His body was solemnly interred at Mesolonghi, and he was honored with the title of the 'Leonidas of Modern Greece.'

BOZZOLO, *bot'so-lo*: town of n. Italy, province of

BRA—BRABANT.

Mantua, on the right bank of the Oglio, about 16 m. w.s.w. of Mantua. B., which was at one time a small independent republic, has remains of old fortifications, some silk-weaving, and an annual fair. Pop. about 4,500.

BRA, *brá*: town in the province of Cuneo, n. Italy, 25 m. n.e. of Coni. It has metal foundries and silk manufactures, and a good trade in cattle, grain, and wine. Pop. 10,500.

BRABANÇONNE, *bră-barong-sŏn*: the patriotic song of the Belgians, originally sung by the insurgents during the revolution of 1830, Sep. A young French player, by name Jenneval, at that time connected with the theatre at Brussels, was the author of the song; it was set to music by a singer named Campenhout. Jenneval fell in a combat with the Dutch at Berchem. The Belgians allowed his mother a pension of 2,400 francs. Campenhout received from King Leopold a golden snuff-box, and was appointed director of the royal chapel. Each verse of the B. ends with the refrain:

La mitraille a brisé l'orange
Sur l'arbre de la liberté.

BRABANÇONS: in the middle ages, adventurous fighters, scarcely better than banditti, from Brabant and neighboring provinces, who served for hire under any leader who would pay.

BRABANT, *bră'bant* or *bră-bánt*: former name of an important province of the Low Countries, extending from the left bank of the Waal to the sources of the Dyle, and from the Maas and the plain of Limburg to the Lower Scheldt. In the time of Cæsar, B. was inhabited by a mixed race of Germans and Celts; it afterward came into possession of the Franks, and in the middle ages it formed a duchy by itself, dependent upon Lower Lorraine, with which, 1107, the county of Antwerp was incorporated, and in 1347, for a time, the lordship of Mechlin or Malines, formerly connected with Liège. After many changes, B. (divided into the provinces of North and South B.) was made a part of the kingdom of Holland, at the Congress of Vienna; but at the revolution of 1830, South B. separated from Holland, and became part of Belgium (q. v.). Old B. is now divided into three provinces: 1. North or Dutch B., 1,960 sq. m.; 2. The Belgian province of Antwerp, 1,094 sq. m.; 3. South B., also Belgian, 1,260 sq. m. The country consists of a plain gently sloping to the n.w., and rising in the s. into gentle hills, which are offsets of those of the Ardennes. In the level northern part are many heathy and fenny tracts; one of them, a morass called the Peel, is 20 m. in length, and from 2 to 6 broad. In the hilly district of the s. is the Forest of Soignies. The Maas and the Scheldt are the principal rivers; but some of their tributaries also are useful for internal commerce, which is further promoted by canals and railways. The soil of North B. is fertile, and wheat, rye, oats, barley, beans, potatoes, beet, colza, madder, flax, and hay are extensively grown; also hops,

BRABBLE—BRACE.

tobacco, and chicory. Farm stock is large. Principal towns are: Hertogenbosch, Tilburg, Breda, and Bergen op-zoom. Soap-boiling, distilling gin, book-printing, refining salt, making beet-sugar, beer, cigars, thread, woolen cloths, leather, earthenware, weaving and printing cottons, Turkey-red dyeing, are chief industries. B. lace has long been celebrated. The inhabitants in the n. are Dutch; in the middle district, Flemish; and in the s. of Walloon race. The boundary between the languages is a few leagues s. of Brussels, the Walloon French being spoken to the s., and Flemish and Dutch to the n. of this line. Pop. (1901) North or Dutch B., 506,551; Belgian province of Antwerp, 819,159; South B. (also Belgian), 1,263,535.

BRABBLE, v. *brăb'bl* [Dut. *brabbelen*, to stammer—an imitative word: comp. Gael. *breacail*, a kicking, quarrelling—from *breab*, to kick]: in *O.E.*, to contest in words with the confused noise of simultaneous talking; to clamor: N. noisy and confused talk; noisy clamor. **BRABBLING**, imp. *brăb'bling*. **BRABBLED**, pp. *brăb'bled*. **BRABBLER**, n. *brăb'blér*, a quarrelsome, noisy fellow.

BRACCATE, a. *brăk'kât* [L. *braccatus*, wearing trousers]: furnished with feathers which conceal.

BRACCIO, *brât-cho*, **FORTEBRACCI**, Count of **MON-TONE**: 1368–1424, June 5; b. Perugia, Italy: a celebrated condottiere (see **CONDOTTIERI**). He was in early youth leader of a troop of mercenaries; championed the Perugian nobles when driven into exile 1393; entered the service of the king of Naples 1408; obtained the sovereignty of Perugia 1416; and captured Rome 1417, but was soon forced to evacuate it. He was crowned Prince of Aquila and Capua 1423, and while aspiring to the throne of Naples he was wounded and captured in battle, and only survived three days.

BRACE, n. *brās* [containing the idea of straining, compressing, or confining: F. *bras*; OF. *brace*, the arm, strength: It. *braca*, a rope resisting a strain: L. *brachia*, arms of the body (see **BRAKE** 1)]: that which holds anything tight or supports anything; a couple or pair, not united by a physical tie, but only in the mode of viewing them; a mark in printing—thus, { ; a rope at the end of a yard for moving it: V. to draw together; to bind; to support; to strengthen. **BRA'cing**, imp.: **ADJ.** giving strength or tone. **BRACED**, pp. *brāst*. **BRACES**, n. plu. *brās'ēs*, supporters for trousers. **TO BRACE A YARD**, to bring it to either side by braces.

BRACE, in Carpentry: oblique piece of wood used to bind together the principal timbers of a roof or other wooden structure: see **ROOF**: **BORING**.

BRACE, CHARLES LORING: 1826, June 19—1890, Aug. 11; b. Litchfield, Conn.: philanthropist and author. He graduated at Yale 1846, and studied divinity in the Yale Divinity School and in Union Theol. Seminary.

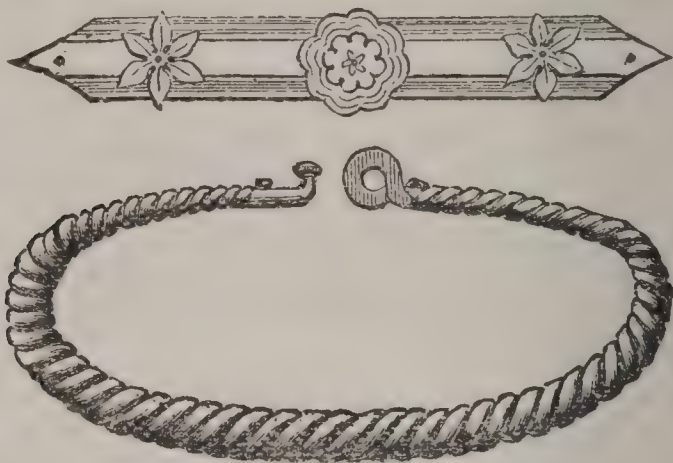
BRACELET.

New York. He travelled afoot in the British Islands and on the continent of Europe 1850,1, and was imprisoned for one month at Grosswardein, Hungary, under suspicion of being a revolutionary agent. On his return to the United States 1852, he began his philanthropic labors for the poor and outcast population of New York, and founded a missionary establishment in a locality called the Five Points, then inhabited by the most degraded elements of the city's population; the Children's Aid Soc. he founded 1853, and the Newsboys' Lodging-house 1854; an Italian industrial school 1855, and a similar school for German children 1856. In the latter year he travelled through Norway and Sweden; made a sanitary investigation of English cities and towns 1865, after which he made another pedestrian journey on the continent of Europe, this time in the Tyrol; he revisited Hungary and Transylvania 1872. He was a frequent contributor to the periodical press. His published books are: *Hungary* in 1851; *Home Life in Germany* (1853); *Norse Folk* (1857); *Race of the Old World* (1863); *The New West* (1869); *The Dangerous Classes of New York* (1872); *Gesta Christi*, a history of humanitarian ideas under Christianity (1883); *The Unknown God*, a history of the different forms of religion (1889). He was succeeded as sec. of the Children's Aid Soc. by his son, **Charles L. B., Jr.**

BRACELET, n. *brās'let* [F. *bracelet*—from OF. *brasselet*, a bracelet: Sp. *bracil*, armor for the arm—from F. *bras*; OF. *brace*, the arm—from OF. *brasse*—from L. *brachium*, the arm (see **BRACE**)]: an ornamental band for the arm, worn usually at the wrist. Bracelets and armlets (Lat. *armille*) have been used by every nation, both savage and civilized, from the earliest periods. They are frequently mentioned in Genesis, as worn by men (xxxviii. 17) and by women (xxiv. 30); both by the Hebrews and the surrounding nations (Num. xxxi. 50). Similar ornaments were worn round the ankles, but they are stigmatized by Isaiah as marks of luxury (iii. 16). The Medes and Persians were remarkable, even among Asiatics, for their love for ornaments of this class. They wore not only bracelets and armlets, but earrings, collars, and necklaces, which often consisted of strings of valuable pearls, or were enriched with other jewels. These ornaments were used to indicate the rank of the wearer, and this use has continued in the East to the present day. In Europe, bracelets and armlets were worn both by the classical nations and by barbarians from the earliest times. The Gauls wore them, and the Sabines, as early as the foundation of Rome, had ponderous golden armlets on the left arm. The same was the case with the Samians about the same period. It does not appear that armlets were worn by men during the historical period of Greece, but women wore both armlets and bracelets of most various materials and forms. Both generally passed round the arm several times, and a modern form of B. has been accurately copied from those twisted spirals described by Homer in the eighteenth book of the

BRACES—BRACHIAL.

Iliad, line 401. Many examples of this kind of B., as represented on painted vases, are in Sir William Hamilton's works. We are indebted to the Greeks even for the idea of giving to these spiral bracelets the form of a snake, the best models of our present goldsmiths being exact copies of antique bracelets. The goddesses of the Greeks, like the blessed Virgin in Rom. Cath. countries, were represented as attired in the style of ladies of the highest rank; and the celebrated marble statue of Aphrodite, preserved at Florence, exhibits traces of a metallic armlet. Among the Romans, armlets were frequently conferred upon soldiers for deeds of valor, of which an instance is mentioned by Livy (x. 44). Roman ladies wore bracelets, not only for ornament, but also for the purpose of containing amulets, which were supposed to effect miraculous cures.



On this principle it is said that the Emperor Nero wore on his right arm the skin of a serpent, inclosed in a golden armilla. But at Rome also, it was chiefly as an indication of rank or wealth that these ornaments were worn. Many Roman bracelets have been preserved, and the accompanying wood-cuts, taken from Smith's *Dictionary of Greek and Roman Antiquities*, from which is drawn much of the information in this article, exhibit two antique bracelets of different forms.

BRACES, on Shipboard: ropes attached to the yard-arms, and employed to shift the sails in a horizontal direction round the masts, so as to receive the wind advantageously. The phrases, 'to brace to,' 'to brace about,' 'to brace the yards sharp up,' etc., apply to this operation.

BRACH, n. *brāk*, or **BRACHE**, *brāch* [OF. *brache*; F. *braque*, a hunting-dog: Prov. *braquet* or *brachet*, a dog that hunts by scent: Gael. *brachach*, a large gray dog; *brach*, a bear]: a dog used in tracking game; a shaggy dog; a dog used by poachers. The word is frequently employed by the older English authors, but the exact kind of dog referred to is not known.

BRACHIAL, a. *brāk'kī-āl* [L. *brachium*, the arm: Gr. *brachion*: It. *braccio*]: of or pertaining to the arm. **BRA'CHIATE**, a. *-kī-ūt*, in *bot.*, having opposite pairs of branches placed at right angles to each other. **BRACHIOPODA**, n. plu. *brāk'ī-ōp'ō-dā*, also **BRACHIOPODS**, *pōds* [Gr. *pous* or

BRACHIAL ARTERY—BRACHIOPODA.

poda, a foot]: a class of Mollusca with one shell on the back and another in front, and having two long spiral ciliated arms developed from the sides of the mouth; the lamp-shells. BRACHIUM, n. *brāk'ī-ūm*, the upper arm of vertebrates. BRACHIA, n. plu. *brāk'ī-ā*.

BRACHIAL ARTERY: that portion of the great arterial trunk supplying the upper extremity between the armpit and the elbow; in other words, it is the continuation downward of the axillary artery. The B. A. runs along the inner side of the arm, just behind the inner margin of the biceps muscle, and behind the great median nerve. Here it may be pressed against the bone, in cases of bleeding from any point below. In its course, the B. A. gives off, 1st, the superior profunda branch, which winds round the back of the arm-bone, and reappears on the outer side, where it joins some twigs coming up from the radial artery; 2d, an artery which enters the bone to supply its medullary membrane; 3d, the inferior profunda, which, running down behind the internal condyle (the funny bone) of the humerus, joins branches coming from the ulnar artery; 4th, a short branch, the *anastomotica magna*, which breaks up into numerous branches inosculating round the elbow.



Brachial Artery:
c, brachial artery; d, superior profunda branch;
e, inferior profunda; f, *anastomotica magna*.

BRACHIOPODA, *brāk'ī-ōp'ō-da* [Gr. arm-footed], or **PALLIOBRANCHIATA**, *pal-lī-ō-brāng-kī-ā'ta* [Gr. mantle-gilled]: class of Molluscoids, by some classed with Vermes; and differing in important points from the vast majority of recent mollusks with bivalve shells, the *Lamellibranchiata* (q.v.). The chief differences existing in the shelly covering itself have been already pointed out in the article **BIVALVE SHELLS** (q.v.), but those of internal structure are still more important. The mantle or *pallium* (see **MOLLUSCA**) in the B. consists of two broad expansions or lobes, covered by the two valves of the shell, and inclosing all the other soft parts of the animal; while respiration or the aëration of the blood is carried on by the surface of these lobes themselves, traversed by minutely ramifying blood-vessels, extended into processes, and furnished, especially along the edge, with vibratile cilia which create a continual current in the surrounding water, and thus keep up a fresh supply, from which the necessary air may be obtained. The organs by which food is procured are also remarkable—two long arms arising from the sides of the mouth, and disposed wholly or

BRACHY—BRACHYPTERÆ.

partly in spiral curves, but never extended to seek or seize prey. These arms are usually furnished with numerous vibratory filaments, which are now supposed to aid not in the capture of prey, but in the maintenance of the current necessary for respiration. The B. are attached to solid bodies either by a footstalk or by one of the valves of the shell. Of existing species, the *Terebratulæ* or Lamp-shells (q.v.) are by far the most numerous; but even these appear to have existed in far greater numbers in former geologic periods, and of some of the other families of B. only a single species is known to exist, or the existing species are very few, while the fossil specimens are very numerous. The existing species are very widely diffused over the globe. All of them are marine, and one (*Orania personata*) has been brought up from the depth of 255 fathoms. The B. are regarded as exhibiting structural affinities not only to the *Ascidia* (q.v.) and the *Lamellibranchiata*, between which they are commonly placed, but also to the class *Bryozoa* or *Polyzoa* (q.v.),

BRACHY, a. *brāk'ī* [Gr. *brachus*, short]: a word frequently made use of in scientific compounds as a prefix, and signifying 'short.' BRACHYPTEROUS, a. *brā-kīp'tēr-ūs* [Gr. *pteron*, a wing]: having short wings. BRACHYURA, n. plu. *brāk'ī-ū'rā* [Gr. *oura*, a tail]: a tribe of the decapod crustaceans having short tails, as the crabs. BRACHYURUS, a. *brāk'ī-ū-rūs*, short-tailed. BRACHYGRAPHY, n. *brā-kīg'rā-fī* [Gr. *grapho*, I write]: art or practice of writing in a short compass; stenography. BRACHYGRAPHER, n. one who. BRACHYLOGY, *brā-kīl'ō-jī* [Gr. *logos*, a word or term]: conciseness of expression.

BRACHYCEPHALI, n. plu. *brāk'ī-sēf'ā-lī* [Gr. *brachus*, short; *keph'alē*, the head]: a short headed ancient race of men in Britain; opposed to DOLICHOCEPH'ALI, (q.v.), long-skulled races. BRACHYCEPHALOUS, a. *brāk'ī-sēf'ā-lūs*, short headed; also BRACHYCEPHALIC, a. *brāk'ī-sēfāl'ik*, short-headed—applied to the form of the head in animals.

BRACHYDIAGONAL, n. *brāk'ī-dī-āg'o-nal* [Gr. *brachus*, short; Eng. *diagonal*]: in *geom.*, the shortest of the diagonals in a rhombic prism. BRACHYSTOCHROME, n. *brāk'īs-tōkrōm* [Gr. *brachistos*, shortest; *chronos*, time]: in *geom.*, the curve of quickest descent, *i.e.*, the curve starting from a given point in which a body descending by the force of gravity will reach another point in the curve in a shorter time than it could have done had it traversed any other path. The curve in question is the cycloid (q.v.).

BRACHYPTERÆ, *brā kīp'tēr-ē*: PYGOPODES; formerly in Ornithology that section of the order of *Palmipedes* (q.v.) or web-footed birds, in which the wings are short, and the feet are placed far back, so as to compel the birds to assume a nearly erect posture when on land. They are all very aquatic in their habits, and excel in diving, so that the name DIVERS is sometimes used as equivalent to B.; but that name is also not unfrequently applied to other aquatic birds, and is sometimes restricted to the genus

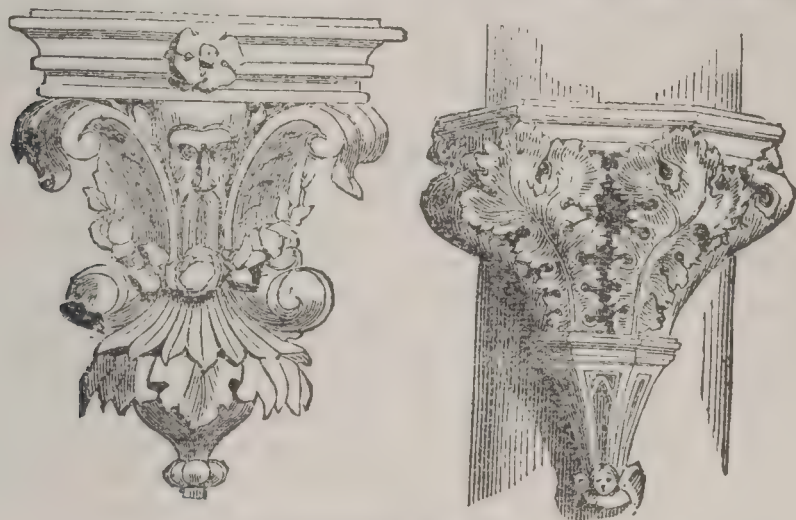
BRACKEN—BRACT.

Colymbus. Auks, puffins, penguins, grebes, guillemots, and divers (*Colymbus*) are among the Brachypterae.

BRACKEN, n. or a. *brāk'ĕn* [Sw. *bräken*; Icel. *burkni*, fern: W. *bruk*, heath: Icel. *brok*, sedge, rough grass (see BRAKE 3)]: ferns; the *Pteris aquilina*, ord. *Filices*, or Fern family.

BRACKET, n. *brāk'ĕt* [Gael. *brac*, an arm: F. *brague*, a mortise for holding things together: Piedm. *braga*, an iron for binding anything together (see BRACE)]: primarily, a cramp-iron holding things together—then a support cramped or fastened to a wall; a piece of wood or metal placed for supporting anything, generally against a wall; crooked lines used in printing—thus, []—to mark off or isolate a part of the text of a book: V. to place within brackets; to join two or more names of candidates as a mark of equality in the result of an examination. **BRACK'ETING**, imp. **BRACK'ETED**, pp. **BRACKET-LIGHT**, a light projecting from a side wall.

BRACKET: ornamental projection from a wall, for the purpose of supporting a statue, bust, or the like: see **CORBEL**. Brackets may be either of stone or wood, and



Ornamental Brackets.

they are sometimes elaborately designed and carved. The term B. is also employed in joinery, etc., to designate supports, in the form of a bent knee, of shelves, galleries, etc. B. is often applied also to projecting gasfixtures.

BRACKETT, *brāk'ĕt*, **WALTER M.**: painter: 1823—; b. Unity, Me. After producing portraits and ideal heads—executing likenesses of many well-known persons—he gained repute as painter of game-fish.—His bro. **EDWARD AUGUSTUS B.** (1819—; b. Me.), sculptor, noted for his portrait busts of eminent men.

BRACKISH, a. *brāk'ĭsh* [Gael. *brach*, fermented, corrupted: Dut. *brak*, brackish, briny: It. *braco*, a puddle: OF. *brac*, mud: Dut. *brack*, refuse]: not quite fresh; salt in small degree. **BRACK'ISHNESS**, n. saltiness in small degree.

BRACT, or **BRACTEA**, *brāk'tē a.* in Botany: a leaf from the axil of which a flower or a floral axis is produced, instead of an ordinary leaf-bud or branch. Bracts are sometimes called floral leaves. The term B. is not, however, generally employed when, as is often the case, there is no

BRACTS—BRADBURY.

marked difference from the ordinary leaves of the plant; but the flowers are said to be axillary, or in the axils of the leaves. On the other hand, the term B. is very frequently applied to all altered leaves interposed between the ordinary leaves and the flower or flowers. In this case they are sometimes very small and scale-like. The ordinary leaves often pass, by imperceptible gradations, into bracts, diminishing in size, becoming more simple, and often also scariose. Bracts are generally entire, even when the ordinary leaves are divided. They are sometimes colored so as apparently to form part of the flower, and sometimes crowded, so as to resemble an involucre or an outer calyx. They appear to serve purposes analogous to those of leaves, or, when colored, of petals. When the primary floral axis is branched, bracts (sometimes distinguished as *bracteoles* or *bractlets*) are often to be seen at its ramifications. Bracts sometimes fall off at an early stage, sometimes they are more permanent, and sometimes they even remain to cover and protect the fruit.

BRACTS, n. plu. *bräkts* [L. *bractĕa*, a thin leaf of metal]: in *bot.*, leaves more or less modified in form. BRACTEATE, a. *bräk'tĭ-ät*, having bracts. BRAC'TEOLE, n. *-tĭ-öl*, or BRACTLET, n. *bräkt'lĕt*, a small bract at the base of the flower-stalk.

BRAD, n. *brăd* [Dan. *braad*, a goad; *bred*, an edge: Sw. *bradd*, an edge; *brodd*, a frost-nail]: a nail with little or no head. BRAD-AWL, an awl for piercing wood or leather to admit *brads* to be driven in more easily.

BRADBURY, *brăd'bér-ĭ*, WILLIAM BATCHELDER: pianoforte maker: 1816, Oct. 6—1868 Jan. 7: b. York, Me. Both his parents were excellent singers; he was master of many musical instruments at the age of 14, but first saw a pianoforte 1830. He taught singing in New York 1840–47; then studied harmony and composition in Germany; engaged with his bro., E. G. B., in pianoforte manufacture and music publishing in New York 1854. He was author or compiler of 59 separate books of music, which have had a total sale of 5,000,000 copies.

BRADDOCK—BRADFORD.

BRADDOCK, *brăd'ok*: borough in Allegheny co., Penn.; on the Monongahela river, and on the Baltimore and Ohio, Pennsylvania and Pittsburgh, and Lake Erie railroads; 10 m. from Pittsburgh; in the centre of a coal-mining dist. Its principal industrial establishments are iron and steel works, and car-works. It has one daily and one weekly newspaper. It was incorporated as a borough 1868. Here, on the site of the old French fort Duquesne, Gen. Edward Braddock (q.v.) was defeated by the Indians and lost his life 1755. B. has a national bank with \$100,000 capital, \$114,000 surplus, \$2,090 undivided profits. Pop. (1880) 3,310; (1890) 8,561; (1900) 15,654.

BRAD'DOCK, **EDWARD**: soldier: abt. 1695—1755, July 13; b. Perthshire, Scotland. In the 'old French war' (see FRENCH WAR) in America, B., a maj.gen. in the Brit. army, was sent to America to command the combined royal and colonial forces. He debarked at Hampton, Va., 1755, Feb. 20. George Washington was chosen his aide-de-camp. At Fredricktown, Benjamin Franklin, then post-master-gen. was, busied in supplying the transportation service; and to him B. unfolded his plan of the campaign—first to take Fort Duquesne (on the site of Pittsburgh) in 3 or 4 days, then Niagara, then Frontenac. Thus B. was ignorant of the topography of the field of operations and of the kind of war in which he was to engage with savage foes. Franklin warned him of the perils of the expedition; but B. deemed it impossible that the savages could make any impression on the king's regular and disciplined troops. When the army had reached the neighborhood of the fort, July 9, the head of the column was attacked from ambush by Indian braves under French officers, and many were killed. The Virginia troops, familiar with such warfare, at once broke ranks, and from behind rocks and trees picked off the enemy; but the gen. insisted on his regulars marching and firing in platoons in proper military order. His men were demoralized, and many (50 at one volley, it is said) of their colonial auxiliaries were killed by their aimless firing. B., after showing the greatest bravery, received a wound which proved fatal 4 days later; and 65 out of 85 officers were wounded or killed. The retreat was conducted by the young Col. George Washington.

BRAD'DON, **MARY ELIZABETH**: see MAXWELL, MARY ELIZABETH (BRADDON.)

BRADFORD, *brăd'ford*: town in Essex co., Mass., on the s. side of the Merrimac river, 18 m. from the sea. Being opposite Haverhill, and connected with it by a bridge, it naturally forms with that flourishing place one consolidated centre of population and trade, both having the same railroad and steamboat connections. B. enjoys the advantages of an old and popular academy for young ladies, whose educational facilities are of a high grade. Manufacture of shoes is the leading business.

BRADFORD: city, McKean co., Penn., 63 m. s.e. of Dunkirk, 23 m. s.w. of Olean, N. Y., by the Buffalo and

BRADFORD.

Phillipsburgh line of the New York Lake Erie and Western railroad. It is one of the largest oil-producing cities in Pennsylvania, there being 125 firms engaged in this business, 11 establishments engaged in manufacturing oil-well supplies, and 9 tank factories, in addition to the oil refineries. Beside its rail facilities it has two seaboard tank lines for the transportation of its immense productions. B. has also 4 boiler shops, 4 saw mills, 3 nitro-glycerine factories, two torpedo and two sucker-rod factories. The city has 8 churches, good graded schools, an opera house, 2 national and 3 state banks, a paid fire department, and 2 daily and 3 weekly papers. There are natural gas wells, also, which supply the city with excellent gas at nominal cost. B. is a growing city. Pop. (1870) less than 4,000; (1880) 9,197; (1890) 10,514; (1900) 15,029.

BRAD'FORD: important manufacturing town in West Riding, Yorkshire, Eng., on a tributary of the Aire, at the meeting of three vales, 8 m. w. of Leeds. A branch canal connects B. with the Liverpool and Leeds canal. B. is the chief seat in England of the spinning and weaving of worsted yarn, and the great mart for the long wools used in worsted and alpaca fabrics. Cottons also are manufactured. There are more than 300 mills, employing 50,000 persons. Notwithstanding the large population, and the nature of their employment, the annual rate of mortality had fallen a few years since from 30 to 24 per thousand. The Saltaire alpaca and mohair mills, on the Aire, 3 m. from B., covering more than 6 acres, erected by Sir Titus Salt, Bart., were the most splendid manufacturing concern in England; but of late this industry has declined. Here is also the largest silk-mill in England. Coal and iron mines are near Bradford. There are over 30 churches belonging to the establishment in the borough, and 80 Dissenting and Rom. Cath. churches. B. has many excellent charities. In the civil wars, the people of B. took the parliament side, and twice defeated the royalists, but were afterward defeated by the Earl of Newcastle. In 1825, a strike for increased wages, in which 20,000 persons were concerned, lasted six months. The Baptists, Congregationalists, and Wesleyans have colleges near Bradford. At Fulneck, 3 m. e. of B., is a Moravian settlement, founded 1748. B. has a spacious and elegant public hall. The merchants of B. are distinguished by their liberality and enterprise. Pop. (1871) 145,827; (1881) 194,495; (1891) 216,361; (1901) 279,809.

BRADFORD, AMORY HOWE, D.D.: Congregational minister: 1846, Apr. 14———; b. Granby, Oswego co., N. Y.; son of a Congl. minister. After graduating at Hamilton College, and studying at Auburn Theol. Seminary, he graduated at Andover Theol. Sem. 1870. He became pastor 1870 of the First Congl. Chh., Montclair, N. J., which under his charge has grown to be one of the great churches of the denomination. Repeated calls to various cities—including one (1893) to the pastorate of the Congl. church in Westminster Chapel, London, one of

BRADFORD.

the great churches of London, England—were declined by him. In 1892 and '93 Dr. B. was Southworth lecturer on Congregationalism in Andover Seminary. He is pres. of the Amer. Institute of Christian Philosophy, and is one of the editors of *The Outlook*, New York. Besides many articles in reviews, he has pub. *Spirit and Life* (1888); *Old Wine: New Bottles* (1892); *Heredity and Christian Problems* (1895).

BRADFORD, ANDREW: 1686–1742; b. Philadelphia; son of the printer William B. (q.v.). He was the only printer in Penn. from 1712–23. 1719, Dec. 22, he began the publication of *The American Weekly Mercury*, the first newspaper printed in the Middle Colonies. He also kept a book-store and was postmaster of Philadelphia. It was this man who first employed Benjamin Franklin in that city, as a type-setter, when he was cold, bedraggled, and friendless, with less than one Dutch dollar in his pocket.

BRADFORD, GAMALIEL: revolutionary officer: 1731, Sep. 2—1807, Jan. 9; b. Duxbury, Mass.; son of Judge Gamaliel B. (1705–78), descendant of Gov. William B. (q.v.). In the old French war he served as major. In the revolutionary army he commanded the 14th Mass. regt. continentals. After the war he was in the legislature, and was appointed a judge.

BRADFORD, JOSEPH (original name WILLIAM RANDOLPH HUNTER): dramatist and journalist: 1843–66; b. near Nashville, Tenn. He was in the navy, 1862–64. Resigning because of illness, he became an actor, changing his name and appearing first in Baltimore. About 1871 he turned from the stage to dramatic and other literary work. Two of his plays, *Our Bachelors*, and *One of the Finest*, had great success, and still hold the stage. His satirical verses in the Boston papers were mostly on political themes. He wrote some notable poems in a serious vein, e.g., on the deaths of Victor Hugo and Gen. Grant. His collected poems have been published.

BRADFORD, ROBERT: officer in the revolution: 1750–1823; b. Plymouth, Mass.; descendant of Gov. William B. (q.v.). His milit. service extended through the war, from Bunker Hill to Yorktown: his rank was that of major, and for his gallantry Lafayette presented him with a sword. He was one of the Ohio company that settled the town of Marietta 1788 (see PUTNAM, RUFUS). In 1789 he with others settled the town of Belpre, Ohio; and in that place he died.

BRADFORD, WILLIAM: 1588–1657; b. England, d. Mass.: second governor of Plymouth colony. As an English puritan, at Leyden, he was active in promoting the scheme of emigrating in an English colony, and was one of the pilgrims in the *Mayflower*. One of his first acts as gov. was to ratify a league with Massasoit, and to suppress a dangerous Indian conspiracy. The patent of 1629 conveys to him his 'heirs, associates, and assigns' the tract on which Plymouth plantation was situated. He was gov. for 31 years, and declined the office five years. B. pos-

BRADFORD.

sessed firmness and energy of mind, with gentleness of heart. He had also good literary culture, and wrote books. His principal literary work was a *History of Plymouth Colony* from 1602 to 1647. See PILGRIM FATHERS.

BRADFORD, WILLIAM: 1658–1752; b. England: printer. He was one of the Quakers brought over by William Penn, 1682. Three years after his arrival he set up a printing-press, the first one s. of New England, and published an almanac for 1686. Having sided against the authorities in the Keith quarrel, he was placed under arrest and his press confiscated. Conducting his own defense with shrewdness in the trial which followed, he escaped punishment through a disagreement of the jury. Having received an invitation to set up a press in New York he settled there, 1793, and printed the laws of the colony the same year. 1725, Oct. 16, he started the first newspaper in New York—*The New York Gazette*. Three years later he established a paper-mill at Elizabeth, N. J. B. was the only printer in New York for 30 years, and he held the office of public printer more than 50 years. He was buried in Trinity church-yard.

BRADFORD, WILLIAM: printer, and milit. officer in the revolution: 1719–1791, Sep. 25; b. New York; grandson of William B., first New York printer. He settled in Philadelphia 1742, and founded the *Pennsylvania Journal*. He interested himself in public affairs, established the London coffee house, and engaged in marine insurance. An able writer, he attached himself to the side of the colonists in their struggle against British dictation; and enlisted in the militia, rising rapidly to be major and col. He fought at Trenton, and was wounded in the battle of Princeton. His paper became, 1801, the *True American*.

BRADFORD, WILLIAM: jurist: 1755, Sep. 14—1795, Aug. 23; b. Philadelphia; son of Col. William B. He graduated at Princeton 1772, studied law, and was admitted to practice 1779. He served in the revolutionary war, and rose to the rank of lieut.col. In 1780 he was made atty.gen. of Penn.; and 1791, Aug. 22, was appointed a judge of the supreme court of the state. Pres. Washington appointed him attorney-gen. of the United States 1794, Jan. 8. He was a graceful writer of verse after the manner of Shenstone; and published 1793 *An Inquiry how far the Punishment of Death is Necessary in Pennsylvania*, which had influence in modifying the penal laws of that state.—His bro. THOMAS B. (1745–1838, b. Philadelphia) was commissary-gen. of the Penn. division of the continental army.

BRAD'FORD, WILLIAM: marine and Arctic painter: 1827–1892, Apr. 25; b. New Bedford, Mass. He was in mercantile business from boyhood until middle life, but gave all his leisure to painting. Unsuccessful as a merchant, he took refuge in his art, and made his first impression by his fidelity and skill in painting ships and boats. Extending his experience, he sketched the coast lines and scenes of New England and the Brit. provinces

BRADFORD CLAY—BRADLAUGH.

as far as Labrador, and became famous for his pictures of icebergs and Arctic scenery. He made excursions into the extreme n. Atlantic with fine results in artistic work. Among his paintings are *Fishing-boats in the Bay of Fundy*; *Shipwreck off Nantucket*; *The Coast of Labrador*; *Crushed by Icebergs*; *Sunset in the North*; *The Island of Grand Menan*; *Arctic Scene*; etc.

BRADFORD CLAY: member of the Lower Oolite: a blue unctuous clay occurring at and near Bradford, near Bath, England; remarkable for containing large numbers of a Crinoid (q.v.), (*Apiocrinites Parkinsoni*).

BRADFORD-ON-AVON: town in the county of Wilts, Eng., on both sides of the Avon, on the Kennet and Avon canal, 6 m. e.s.e of Bath; noted for many centuries for its manufacture of fine broadcloths. Kerseymeres were first made here. Pop. (1881) 4,922; (1891) 4,957.

BRADISH, *brā' dīsh*, **LUTHER**: statesman: 1783, Sep. 15—1863, Aug. 30; b. Cummington, Mass. After graduating at Williams College 1804, and studying law, he travelled in Europe; on his return home was commissioned by the U. S. govt. to visit the Levant and collect information regarding its commercial relations. He sailed in the war-ship *Columbus* 1820, and on the fulfillment of his mission continued his travels in Europe and the East. He settled in Franklin co., N. Y., 1826; was member of the state assembly 1827–30 and 1835–38; lieut.gov. 1839–43; meanwhile was defeated as whig candidate for gov. Under Pres. Fillmore he was assist. U. S. treasurer in New York. At his death he was pres. of the Amer. Bible Society.

BRADLAUGH, *brād' law*, **CHARLES**: social reformer: 1883, Sep. 28—1891, Jan. 30; b. London. As a boy he was thrown on his own resources and made a living as best he could; in early manhood enlisted as a soldier, but procured a discharge 1853, and was employed as a lawyer's clerk. His leisure he gave to reading and study of questions regarding religious belief, and adopting the Secularist platform, began to deliver 'Freethought' lectures everywhere and to contribute to the *National Reformer*. He was elected to parliament by Northampton 1880. On presenting himself in the house of commons he refused, as an atheist, to take the oath of allegiance. The house refused to accept him as a member. B. then declared his willingness to take the oath, but the house would not assent; he was not permitted even to 'affirm.' B. carried his quarrel before his Manchester constituents when the house had declared his seat vacant. They re-elected him, but the house again refused to admit him. B., however, persisted, was elected the fourth time, took the oath, and was admitted to his seat. In parliament he immediately won, and retained to the end, the respect of his fellow-members. For publishing *Fruits of Philosophy* he was sentenced to pay a fine and to be imprisoned 1876; but the judgment was reversed. See OATH.

BRADLEY.

BRADLEY, *brăd'li*, GEORGE GRANVILLE, D.D., LL.D.: Anglican clergyman: 1821, Dec. 11—1903, Mar. 12. b. Glasbury, England. At Rugby he was a pupil of Dr. Arnold, and his tutor at Oxford was Arthur P. Stanley (afterward Dean): he graduated with high honors at Oxford 1844, and was elected to a fellowship. He was several years an asst. master at Rugby, and 1858 became headmaster of Marlborough Coll.; master of University Coll., Oxford, 1870; canon in Worcester Cathedral 1881; and dean of Westminster the same year, succeeding Dean Stanley. He pub. *Recollections of Arthur Penrhyn Stanley* (1883), and was editor of memoirs and letters of him. In the dept. of biblical research he also published *The Book of Ecclesiastes* (1885), and *The Book of Job* (1887), under the general title *Westminster Abbey Lectures*. B. was author of a work on *Latin Prose Composition*, which had large circulation in the United States and England. His degree LL.D. was conferred by the Univ. of St. Andrews 1873, his degree in theol. by the Univ. of Oxford 1881.—His daughter Margaret L. (B.) Woods, wife of the pres. of Trinity Coll., Oxford, wrote *A Village Tragedy* (1887): another daughter, Elizabeth B., *Memoirs of Lady Arabella Stuart* (1889).

BRADLEY, *brăd'li*, JAMES, D.D: 1692 Mar.—1762: July 13; b. Sherbourne, Gloucestershire, Eng.: astronomer and discoverer. Being intended for the priesthood, he graduated at Oxford, and obtained successively the livings of Bridslow and of Welfrie, Pembrokeshire. Applying himself to mathematics and astronomy, he made such advancement as soon won the friendship of the leading mathematicians of his time, notably Isaac Newton, and caused his election as a member of the Royal Soc. About this time, 1721, he became, in his 29th year, Savilian prof. of astronomy at Oxford, resigned his livings, and gave himself to science. In 1727 he published his theory of the aberration of the fixed stars, with the important discovery of the Aberration of Light (q.v.), to which, it is related, he was led somewhat by accident, as Sir Isaac Newton was to the theory of gravitation. Three years afterward B. became lecturer on astronomy and physics at the Oxford Museum. His next discovery was that the inclination of the earth's axis to the ecliptic is not constant, a fact including the explanation of the precession of the equinoxes and the nutation of the earth's axis. Latterly B. became Regius prof. of astronomy at Greenwich, where his observations further enriched science. For his services to navigation he received from the crown a pension of £250 a year.

BRADLEY, JOSEPH P., LL.D.: 1813, Mar. 14—1892, Jan. 22; b. Berne, N. Y.: jurist. He graduated at Rutgers College 1836; was admitted to the bar 1839; settled in Newark, N. J., and practiced there for 30 years; was engaged in many important cases in the courts of N. J. and of the United States for that district; was mathematician

of the Mutual Benefit Life Insurance Co. 1851-63, and director and counsel in several large corporations for many years; republican presidential elector 1868; and was appointed by Pres. Grant an assoc. justice of the U. S. supreme court 1870, Mar. 21. He received his degree from Lafayette College 1859; was chosen by four of his associates on the supreme court bench to be the fifth member of the electoral commission 1877, and concurred in the judgment of the republican members of the commission and supplemented his votes by remarkably comprehensive arguments. He was widely known for his mathematical, historical, and genealogical researches.

BRADOON: see BRIDOO.

BRADSHAW, JOHN: 1602-1659, Nov. 22; of a good family in Cheshire, England: regicide. He studied law at Gray's Inn. Called to the bar, he gained a good practice by his ability and learning especially as a chamber counsel. In 1646, Oct., he was appointed a commissioner of the Great Seal, and in 1647, Feb., chief-justice of Chester. In 1648, Oct., he received the degree of sergeant, and in the following Jan., was elected pres. of the high court of justice for the trial of King Charles I. As the reward of his services on that solemn occasion, he was made pres. of the council of state and chancellor of the duchy of Lancaster, beside the grant of estates worth £4,000 per annum, the deanery house of Westminster for a residence, and £5,000 to furnish it. B., however, refused submission to the Protector. He was an able lawyer, but not an able politician. His mind was rigid rather than broad, and, in consequence, he was unable (like so many others of the stern fanatical republicans of his time) to see or comprehend the necessity for a great iron rule like Cromwell's. He even engaged in some Fifth Monarchy and other plots against Cromwell, but his respectable character and past services saved him from molestation. He was deprived, however, of his office as chief-justice of Chester. After Oliver's death, he was lord president of the council of state, and a commissioner of the Great Seal under Richard. His last public act was to protest against the violent seizure of Speaker Lenthall by the army. He died 1659, Nov. 22. His body was buried with pomp in Westminster Abbey, but was afterward exhumed and hung on a gibbet, with those of Cromwell and Ireton.

BRADSHAW'S RAILWAY GUIDE: pioneer and still the type of the extensive class of publications for giving all necessary information in regard to travelling. It derives its name from George Bradshaw (1801-53) originally a map-engraver in Manchester, England, who in 1839 issued an occasional work, called in 1840 the *Railway Companion*, corrected by a broad sheet, styled *Monthly Time Tables*. By great efforts, the railway companies having been induced to adjust their tables, once for all, for the beginning of each month, the first number of the monthly *Railway Guide* was brought out 1841, Dec. The second number, '1st month (Jan.), 1842,' had 32 pages, and con-

tained 42 or 43 lines of railway, in England only, without any advertisements. The plan, gradually enlarged and perfected, resulted in the well-known *Railway and Steam Navigation Guide* for Great Britain and Ireland with more than 450 pages—price 6*d.* It has been the model for similar works in Britain; and its plan has been imitated in France, Germany, the U. S., and even at the antipodes.

In 1847, the first number of *Bradshaw's Continental Railway Guide* was issued, which, in addition to the tables, gives a large quantity of topographical information. A series of *hand-books* of travel in various countries, projected by Mr. Bradshaw, also has been issued.

BRADSTREET, ANNE (DUDLEY): earliest American poetess: 1612–72; b. Northampton, Eng.; dau. of Thomas Dudley (gov. of the Mass. colony). She married (1628) Gov. Simon Bradstreet (q.v.), and emigrated with him to New England 1630. She was the mother of eight children. Of her poems on a variety of subjects, *Contemplations* is considered the best. They are quaint and curious in style and show much learning. The London publisher of her poems styled her 'The Tenth Muse lately sprung up in America.' John Harvard Ellis, of Charlestown, Mass., reprinted her complete works 1868.

BRADSTREET, *brad'strēt*, SIMON: 1603–97: gov. of Mass. colony. He was born in England, where he became steward to the Countess of Warwick, and married the poetess, Anne Dudley. He emigrated to Massachusetts with the early settlers, arriving at Salem 1630. He held the various offices of assistant judge, agent, secretary, and commissioner of the united colonies. In 1662 he went to England to congratulate the king on his restoration. He was assistant gov. (1630–73), deputy gov. (1673–79), gov. 7 years from 1679 until the charter was recalled, and again 1669, May—1692, May, when, at the arrival of the new charter, he became first councilor.

BRADY *brā'dī*, HUGH: milit. officer: 1768, July—1851, Apr. 15; b. Northumberland co., Penn. Entering the army 1792, he was promoted lieut. 1794; capt. 1799; col. 1812, leading the 22d infantry with great bravery in the battle of Chippewa. He was wounded at Lundy's Lane and Niagara. He was brevetted brig.gen. 1822, and placed at Detroit in command of a dept. 1835; and for long and faithful service was brevetted maj.gen. 1848. D. in Detroit.

BRADY, JAMES TOPHAM: legal advocate: 1815, Apr. 9—1869, Feb. 9; b. New York. He studied law under his father, Thomas S. B., jurist, and began practice, New York 1836. He early gained great reputation for his successful defense in different criminal cases, likewise for his skillful conduct of civil causes. As advocate in an unpromising criminal case he was unsurpassed for clearness of statement, for tact and courtesy in cross-examination, and for impressive eloquence in appeal. Before the war he was a pro-slavery and state-rights democrat, and candidate for gov. of N. Y. 1860; but warmly supported the war measures of Lincoln's administration. D. New York.

BRADY, *brā'dǎ*, NICHOLAS, D.D.: 1659–1726: b. Bandon, Ireland: divine and author. He graduated at the Univ. of Dublin, and became chaplain to William III. and Mary. He favored the revolution, but during the disturbances of 1690, by his personal influence, saved his native town three times from being burned, though James II. had ordered its destruction. He wrote *A Translation of Virgil's Æneid*, and in conjunction with Nahum Tate, made a metrical version of *The Psalms of David*, long in common use.

BRADYPODIDÆ, n. plu. *brăd'î-pöđ'î-dē* [Gr. *bradus*, slow; *podes*, feet]: the family of edentata comprising the sloths. BRAD'YPUS, n. *-pūs*, the sloth (q.v.).

BRAE, n. *brā*, BRAES, n. plu. *brāz* [Gael. *bruach*, a bank, a steep ascent: OE. *bray* or *braye*, a rising ground]: in *Scot.*, a hillside; the face of a hill; a rising ground.

BRAEMAR, *brā-mār'* (including the united parishes of Braemar and Crathie): extensive Highland dist. occupying the s.w. corner of Aberdeenshire, in the heart of the Grampian Mountains, and intersected by the upper part of the Dee and its tributaries. The chief mountains are Ben Macdhui (q.v.); Cairntoul, 4,220 ft.; Braeriach, 4,225; Ben-a-Buird, 3,851; and Ben Avon, 3,826, on the n.; and Lochnagar (q.v.) on the s. Patches of snow lie on these mountains all the year round. The rocks of B. are granite, gneiss, and quartz, with beds of primary limestone, and masses of serpentine, trap, and porphyry. Most of the district is uncultivated, and consists of heathy tracts, while about a twentieth of the surface is in wood. The natural woods are birch, alder, poplar, and rowan, and the planted chiefly larch and Scotch fir. The fir-timber of the ancient Caledonian forest of Mar, now nearly all cut down, is, for size and quality, the best in the kingdom. Reddeer, roes, grouse, ptarmigan, and alpine hares abound. Many rare alpine plants are found on the mountains and in the glens. Black-faced sheep and small black-horned cattle are reared. Here the Earl of Mar first raised his standard for the Pretender, 1715, Sep. The district is intersected by the great military road from Blairgowrie to Fort George, made by General Wade. In the e. part of the district is Balmoral (q.v.); and near its centre is the small village of Castleton of B., a favorite resort for travelers, sportsmen, and lovers of grand scenery. Pop. about 2,000, many of whom still speak Gaelic.

BRAG, n. *bräg* [F. *braguer*, to flaunt: W. *bragio*, to brag; *brac*, boastful: Icel. *braka*; Dan. *brag*, a crack, a crash: Gael. *bragh*, a burst or explosion; *breug*, a falsehood—*lit.*, to thrust one's self on the notice of others by making a noise]: a boast; proud expressions; thing boasted: V. to boast; to speak highly of one's self in regard to anything. BRAG'GING, imp.: N. the act or habit of a bragger. BRAGGED, pp. *brăgd*. BRAG'GER, n. one who. BRAGGART, a. *brăg'gert*, boastful: N. a vain, boasting person. BRAG'GARDISM, n. *-dīzm*, and BRAG'GARTISM, n. *-tīzm*, boastfulness; vain

ostentation. BRAGGADOCIO, n. *brăg'gă-dō'shĭ-ō* [It.]: a puffing, boasting fellow; a swaggerer.

BRAGA, *brá'gá*: city of Portugal, cap. of the province of Minho; on an eminence between the rivers Cavado and D'Este, about 35 m. n.e. of Oporto. The neighborhood is charming, especially along the banks of the river Cavado. B. is surrounded by old walls, flanked with towers, and defended by a castle. It is the residence of the primate of Portugal, who has a palace here. It has also a fine Gothic cathedral, several spacious squares; and manufactures of linen, hats, cutlery, firearms, jewelry, etc. Pop. (1878) 20,258. It is a very ancient place, being supposed to owe its origin to the Carthaginians. In the time of the Romans, the city was named *Bracara Augusta*, and the ruins of a temple, an amphitheatre, and an aqueduct, belonging to that era, still remain. Not far from B. stands the celebrated *Sanctuario do bom Jesus do Monte*, still a place of pilgrimage. After the Suevi had taken Lusitania from the Romans, B. was made the metropolis; and here, at a council held 563, the Suevi, with their king, renounced the errors of Arianism, and submitted to the teaching of the Rom. Cath. Church. After the fall of the Suevian and West-Gothic kingdom, B. fell into the hands of the Arabs, from whom it was taken by the forces of Old Castile, 1010. After the establishment of the Portuguese dynasty it was annexed to the crown of Portugal. Pop. about 20,000.

BRAGANÇA, *brá-gân'sá*: seaport of Brazil, abt. a degree s. of the equator, at the mouth of the Caié, which enters the Atlantic about 100 m. to the e.s.e of the Amazon. Pop. abt. 6,000.

BRAGANÇA: inland city of Brazil, 50 m. n.e. of San Paulo, and about 200 w. of Rio Janeiro; about a degree n. of the tropic of Capricorn. Pop. abt. 10,000.

BRAGANZA, or BRAGANÇA, *brá-gân'sá*: city of Portugal, cap. of the province 'Tras-os Montes, in a pleasant and fertile district, on the river Fervença, affluent of the Sabor. The city is surrounded with walls; has two castles, partly in ruins, of which one was the ancestral seat of the Dukes of B; and has manufactures of silk and velvet. This city gives its name to the House of Braganza, the present ruling dynasty in Portugal (see PORTUGAL). John, eighth Duke of Braganza having ascended the throne as John IV., when the Portuguese liberated themselves from the Spanish yoke, 1640. Pop. of B. 5,000.

BRAGG, *brăg*. BRAXTON: 1817, March 22—1876, Sep. 27; b. Warren Co., N. C.: general. He was educated at West Point, graduating, 1837, with Sedgwick, Hooker, Early, and Pemberton. He served with distinction in the Seminole and Mexican wars, and was promoted for bravery at Monterey and Buena Vista. Resigning his commission, 1856, he retired to a plantation in Louisiana, where he held the office of commissioner of public works for several years. When the rebellion opened he joined the Confederate army. After the battle of Shiloh he was promoted general in place of A. J. Johnston, killed. At Perryville he was

defeated, but made a successful retreat. He was then removed from command, but was soon afterward restored. At Murfreesboro he was defeated by Rosecrans, and at Chattanooga, by Grant. B. was a favorite of Jefferson Davis, and for a time acted as his chief military adviser. After the war he was appointed chief engineer of Alabama and superintended the improvements in Mobile Bay.

BRAGGET, n. *bräg'gèt* [W. *brag*, malt; *bragod*, bragget; Gael. *bracha*, malt; *brachada*, fermentation]: sweet-wort; a liquor made made from ale-wort and mead.

BRAGI, *brā ge:* in the Norse or Scandinavian mythology; son of Odin and Frigga; the god of poetry and eloquence. Upon his tongue were engraved the runes of speech, so that it was impossible for him to utter a sentence that did not contain wisdom. According to the older or poetic Edda, he was the most perfect of all scalds or poets, and the inventor of poetry, which is designated by a kindred word, *bragr*. Unlike Apollo, who, in the Greek mythology, is represented as enjoying eternal youth, B. was supposed to be an old man with a long, flowing beard; but his brow was always mild and unwrinkled. B.'s wife was Idunna. Together with Hermóthir or Hermode, he received and welcomed all those heroes who had fallen in battle, on their arrival in Valhalla. On festive occasions, as well as on the burial of a king, a goblet, called Bragafull (B.'s goblet), was presented, before which each man rose up, made a solemn vow, and emptied it. Several German periodicals and works, intended to cherish a national spirit, have taken the name of Bragi.

BRAHAM, *brā ham*, JOHN: 1777-1856, Feb. 5; b. London, of Jewish origin: tenor singer. He had an unusually long professional career, having sung on the stage at the age of ten, and continued to make occasional appearances at concerts until within a few years of his death. About the close of the 18th c. he visited France and Italy for improvement; returning to London, his triumph was transcendent, and from that time, for half a century, he held the reputation of one of the greatest tenor-singers in Europe. It was as a concert-singer that he excelled, and his great declamatory power and florid execution made his singing of the national songs wonderfully effective.

BRAHÉ, *brā* or *brā*, DAN. *brā ēh*, TYCHO: 1546-1601, Oct. 13; b. at Knudstrup, Sweden, then a province of Denmark; descended from a noble family, originally Swedish. His is one of the most distinguished names in astronomical science. He was sent, at the age of 13, to the Univ. of Copenhagen, where he had not been more than a year, when an eclipse of the sun turned his attention to astronomy. His uncle, who destined him for the law, furnished him with a tutor, and sent him to Leipsic, 1562, but B., who cared nothing for that study, devoted just so much time to it as would save appearances, and while his tutor slept, busied himself nightly with the stars. By these surreptitious observations of the heavens, and with no other mechanical contrivances than a globe about the size of

BRAHEA—BRAHILOV.

an orange, and a pair of rude compasses, he succeeded, as early as 1563, in detecting grave errors in the Alphonsine and Prutenic tables, and set about their correction. The death of an uncle, who left him an estate, recalled him to his native place 1565; but he very soon became disgusted with the ignorance and arrogance of those moving in the same sphere with himself, and went back to Germany. At Wittenberg, where he resided for a short time, he lost part of his nose in a duel with a Danish gentleman; but for the lost organ he ingeniously contrived one of gold, that fitted so admirably, and was so naturally colored, that few could have detected that it was artificial. After a couple of years spent in Augsburg, he returned home, where, 1572, he discovered a new and brilliant star in the constellation Cassiopeia. In 1573, he married a peasant girl, which his fellow-noblemen thought even more undignified than being addicted to astronomy; and that they considered very degrading in a gentleman, whose only becoming qualification was, in their estimation, expertness in the use of arms. After some time spent in travel, B. received from his sovereign, Frederic II., the offer of the island of Hven or Hoëne, in the Sound, as the site for an observatory, the king also offering to defray the cost of erection, and of the necessary astronomical instruments, as well as to provide him with a suitable salary. B. accepted the generous proposal, and in 1576 the foundation-stone of the castle of Uraniberg ('city of the heavens') was laid. Here, for 20 years, B. prosecuted his observations with the most unwearied industry—with a zeal, in fact, sufficient to create a new epoch—one of the three great epochs indeed—in astronomy as a science of observation. See ASTRONOMY. The scientific greatness of B. was no protection against the petty prejudices of the nobles, who could not bear to see honor heaped on one who, according to their notions, had disgraced their order, nor against the meaner jealousies of physicians, who were annoyed at his dispensing medicine gratis to the poor. So long as his munificent patron, Frederic II., lived, B.'s position was all that he could have desired, but on his death, 1588, it was greatly changed. For some years under Christian IV., B. was barely tolerated; but in 1597, his persecution had grown so unbearable, that he left the country altogether, having been the year before deprived of his observatory and emoluments. After residing a short time at Rostock and at Wandsbeck near Hamburg, he accepted an invitation of the Emperor Rudolf II.—who conferred on him a pension of 3,000 ducats—to Benatek, a few miles from Prague, where a new Uraniberg was to have been erected for him; but he died at Prague. At Benatek he had Kepler as his assistant, and to the advice of B. that celebrated astronomer owed much. The scientific publications of B. are numerous.

BRAHEA, n. *bră-hē'ă* [unascertained]: a genus of fan-leaved palms, having spiny leaf-stalks, and hermaphrodite flowers, ord. *Palmæ*; *B. filamentosa*, a species having palmatifid leaves and whitish filaments.

BRAHILOV. *bră-hē-lov'*, or **IBRÄIL**, *ē-bră-ēl'*, or **IBRAILA**,

BRAHMA.

ē-brā-ē'lā: free port of the kingdom of Roumania, on the left bank of the Danube, about 99 m. from its mouth; chief shipping port of Roumania, whence large quantities of corn and other products are exported. The sturgeon fisheries on the Danube are a source of considerable profit to B. A railway from Galatz to B., thence to Bucharest, was completed 1873. During the war of 1854-56, B. was occupied by Russian troops. Pop. (1894) 46,715.

BRAHMA, n. *brā'mā* [Sks. *brahman*, a prayer, a brahman]: the universal spirit: also, the chief god of the Hindu pantheon. **BRAHMANIC**, a. *brā-mān'ik*, relating to the Brahmans. **BRAHMAN**, n. *brā'mān*, also **BRAHMIN**, n. *brā'min*, a Hindu of the highest or priestly caste—the highest caste in the Hindu system (see **CASTE**). **BRAHMINISM**, n. *-izm*, the religion of the Brahmins. **BRAHMINICAL**, a. *-i-kāl*, relating to the office or character of a Brahmin. **BRAHMO**, n. *brā'mō*, a theistic Hindu who has renounced idolatry, and become a member of the *Somaj* or congregation of reformers. **BRAHMO-BRAHMISM**, *-brā'mizm*, the creed of the Hindu reformers. **BRAHMIC**, a. *brā'mik*, pertaining to. **BRAHMO-SOMAJ**, *so-māj'*, the congregation or church of the Hindu theists.

BRAHMA, *brā'ma*, in the religion and philosophy of the Hindus: a word having two related meanings. The crude or undeclined form is *brahman*, the etymological signification of which is doubtful; when declined as a neuter noun, it has the nominative *Brahma* (with the final syllable short); as a masculine, it is *Brahmā* (with the *a* long).

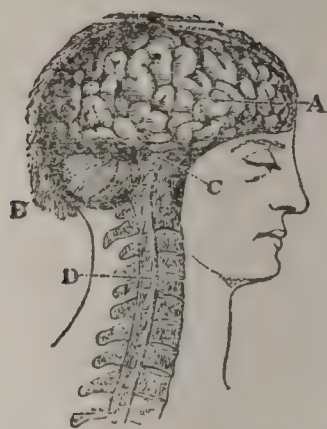
BRAHMĀ (neuter) designates the universal Spirit, the ground and cause of all existence; not, however, conceived as an individual personal deity to be worshipped, but as only an object of contemplation. It is spoken of as 'that which is invisible, unseizable, without origin, without either color, eye, or ear, eternal, manifold (in creation), all-pervading, undecaying—the wise behold it as the cause of created beings.' The human soul is a portion of this universal Spirit, and a man can be freed from transmigration, and be reunited to *Brahmā*, only by getting a correct notion of it and of the soul.

BRAHMĀ (masculine) is one of the three chief gods of the Hindu pantheon, and is specially associated with the function of creation. See **TRIMURTI**. Yet he himself is a creation of or emanation from *Brahmā*, the First Cause. The origin of *Brahmā*, and the way in which he created heaven and earth, is thus narrated by Manu:

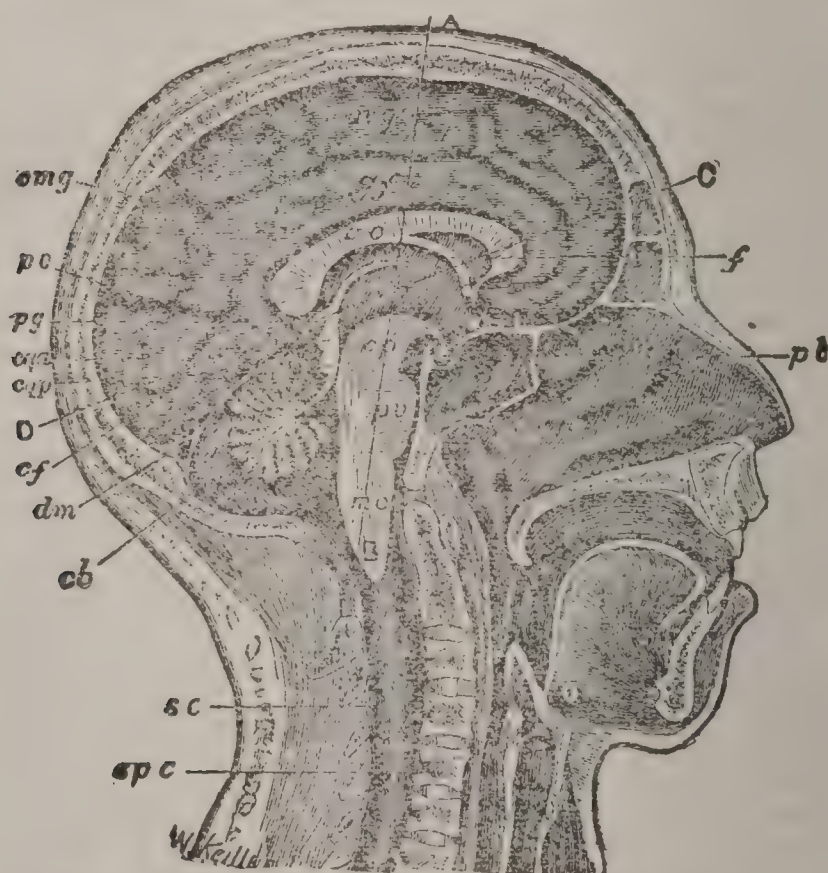
'This universe was enveloped in darkness, unperceived, undistinguishable, undiscoverable, unknowable, as it were entirely sunk in sleep. Then the irresistible self-existent Lord, undiscerned, causing this universe with the five elements, and all other things, to become discernible, was manifested, dispelling the gloom. He who is beyond the cognizance of the senses, subtile, undiscernible, himself shone forth. He, desiring, seeking to produce various creatures from his own body, first created the waters, and



Brahma, from an idol in the Indian Museum.



Section of Human Head showing Brain: A, Cerebrum; B, Cerebellum; C, Pons Varolii; D, Spinal Cord or Marrow.



Brain.—Median Longitudinal Section through Head and Upper Part of Neck, to show relation of Brain to Cranium and the Spinal Cord: *c*, Cerebrum; *cb*, Cerebellum; *sc*, Spinal cord; *spc*, Spinal column; *mo*, Medulla oblongata passing, through foramen magnum, into the spinal cord; *pv*, Pons Varolii; *cp*, Cerebral peduncles, or *crura cerebri*; *cqa*, Anterior corpora quadrigemina; *cqp*, Posterior corpora quadrigemina; *pg*, Pineal gland; *pb*, Pituitary body; *cc*, Corpus callosum, divided transversely; *f*, Fornix; *mg*, Marginal gyrus; *gf*, Gyrus fornicatus; *cmg*, Callosomarginal sulcus; *O.*, Occipital lobe; *po*, Parieto-occipital fissure; *cf*, Calcarine fissure; *dm*, Dura-mater, separating cerebrum from cerebellum. The lines CD and AB show the positions of the sections in Plate 31, figs. 1 and 2 respectively.

BRAHMANBERIA—BRAHMO SOMAJ.

deposited in them a seed. This [seed] became a golden egg, resplendent as the sun, in which he himself was born as Brahmā, the progenitor of all the worlds. Being formed by that First Cause, undiscernible, eternal, which is both existent and non-existent, that Male (parusha) is known in the world as Brahmā. That lord having continued a year in the egg, divided it into two parts by his mere thought. With these two shells he formed the heavens and the earth; and in the middle he placed the sky, the eight regions, and the eternal abode of the waters.' —See Dr. J. Muir's *Original Sanscrit Texts*, vol. iv., 31.

In later times at least, B. has had few special worshippers; the only spot where he is periodically adored being at Pushkara in Rājputana. He sometimes receives a kind of secondary homage with other deities. B. is represented with four heads. See INDIA (*Religion*): TRIMURTI; VISHNU; SIVA; VEDĀNTA.

BRAHMANBERIA, *brā-mān-bēr'i-ā*: town of India in the presidency of Bengal, division of Chittagong. It has sea and railway communication with Calcutta. Pop. (1872) 12,364: (1881) 17,438.

BRAHMAPUTRA, *bra-ma-pō'tra*: river which rises in Tibet, and, after partially mingling with the Ganges, flows into the Bay of Bengal by three mouths. It is formed by the junction, in Assam, of two main branches—the Brahmaputra, from the n.e., and the Sanpoo, from the n.w.; the entire length exceeds 900 m. from one source, and 1,700 from the other. The B. proper rises about lat 28° 30' n., long. 97° 20' e.; while the Sanpoo springs from the same swamp as the Sutlej and the Indus. About 360 m. below their confluence, the B. leaves Assam, near Goulpara, and after 60 m. more in a s.w. direction, takes a sweep round the w. extremity of the Garrow Mountains. In lat. 25° 10' n., long. 89° 43' e., it throws off the Konaie, and after a course of 180 m. is named the Meghna. Ninety m. from the sea, it combines with the Ganges in cutting up their common delta into a network of inland navigation.

BRAHMIN OX: see ZEBU.

BRAHMO SOMAJ, *brā'mo so-māj'* (*Theistic Church*): religious and social association in India, originated by the celebrated Hindu Rajah, Rammohun Roy, 1830, under the title *Society of God*. The accession of Debendra Nath Tagore, a wealthy Calcutta Brahman, 1842, gave the movement a great impetus, which was also much aided by the spread of English education (see RAMMOHUN ROY). Its main development took place under Keshub Chunder Sen (b. 1838, d. 1884). He joined the new church, 1858, and visited Europe, 1870. It was his aim to apply the principles of the church to practical life, and under his leadership the progressive party seceded from the original church, and assumed the title 'Brahmo Somaj of India.' Their fundamental principles are that there is but one Supreme God, the object of worship; that nature and intuition are the sources whence our knowledge of God is

derived; and that religion admits of progressive development. They ignore all distinctions of caste, and consider all men as God's children; they abjure all idolatrous rites, and acknowledge no sacred books or places, but value what is good and true in all religions, and recognize the necessity of public worship. In 1877, the B. had 107 branches throughout India, some following the conservative and some the progressive type. They maintained two periodicals and several schools. Since then lamentable dissensions have taken place, leading to a serious schism in the Progressive B. It had done good work in sending out missionaries; publishing a Sunday edition of its daily newspaper (*The Indian Mirror*); encouraging fervor of devotion; singing rapturous hymns in chorus, sometimes in procession through the streets, and establishing periodical religious festivals as times for special prayer, and rejoicing. But its once excellent leader, who could endure everything else, could not endure success. People began to complain that Keshub Chunder Sen had become an autocrat, an irresponsible dictator, bishop, priest, and deacon, all in one, a kind of pope, whose will was law. Though this great reformer had himself once denounced early marriage as the curse of India, he permitted, 1878, Mar. 6, his daughter of 14 years to marry the young Mahārājā of Kuch Bahār, then but 16 years of age. After fruitless efforts to depose Sen, a new church 'The Sād-hārana (or general) Brāhma-Samāj' was established on a more democratic basis than the older organization. In 1883 the number of theistic churches in India had increased to 170 or more. See SEN, KESHUB CHUNDER.

BRAHMS—BRAILS.

BRAHMS, *brāmz*, JOHANNES: musical composer: 1833, May 7—1897, Apr. 3; b. Hamburg. He received instruction in music first from his father, then from Eduard Marxsen, and when only 20 years old earned the highest commendation from Schumann. He was then for several years musical director at the court of Lippe-Detmold, in the mean time applying himself assiduously to study and composition. Going to Vienna 1862, he was director of the singing acad. there 1864, and then visited in succession Hamburg, Zürich, and Baden-Baden, staying for some time in each, but returning to the Austrian capital 1869, and making there his home. In Vienna he was conductor of the concerts of amateur musicians 1872-74. It was his great *German Requiem* (1868) that established B.'s reputation as a composer. His style was at first dominated by the new school of Schumann, but later he was more in sympathy with the classical school. In fact he combines in his works the different styles, and may be claimed both by the progressists and by the classicists with equal reason. Of his pieces for the pianoforte the most noteworthy are: three great sonatas (op. 1, 2, 5), a scherzo (op. 4), ballades (op. 10), a great many variations on Schumann's themes, and the *Liebestlieder* (2 series). Among his later works are *Rinaldo*, a cantata; *Schicksalslied*; *Triumphlied*; and *Rhapsodie* (from Goethe's *Harzreise*). His songs (*Lieder*), mostly in Schumann's style, have become very popular all over the world, as also his unrivalled settings of Hungarian dances. Of all his contemporaries B. is held to approach nearest to Beethoven in the ideal scope of his melodic inventions. His works touch every department of musical composition except the dramatic.

BRAID, n. *brād* [AS. *bredan*, to weave: Icel. *bregda*, to weave nets: Gael. *breid*, a napkin]: a complicated woven texture; flat cord; trimming; a band of hair formed by plaiting three or more folds together: V. to weave or plait. **BRAIDING**, imp. **BRAID'ED**, pp.: **ADJ.** edged with plaits or knots.

BRAID, n. and a. *brād* [the participle of the verb *bray*: Icel. *bragð*, the gestures by which an individual is characterized; *bregda*, to braid the hair, to weave nets, etc.]: in *OE.*, a word of difficult explanation, and of very wide and loose import; 'any kind of sudden or violent action'; a start; a snatch; fancy; caprice: **ADJ.** resembled; mannered. See Wedgwood, Latham, and Halliwell on the word.

BRAIDWOOD, *brād'wúd*: town of Will co., Ill., on the Chicago and Alton railroad; 58 m. s.w. of Chicago, and about three m. s.w. from the Kankakee river. It has half a dozen churches, and two weekly newspapers. In the neighborhood are mines of bituminous coal. Pop. (1900) 3,279.

BRAILS, n. plu. *brālz* [F. *braies*, breeches, drawers: OF. *brail*, a cincture or waistband for breeches]: a piece of leather to tie up a hawk's wing; in a *ship*, small ropes used to truss up sails: V. to tie up with a brail. **BRAIL'ING**, imp. **BRAILED**, pp. *brāld*.

BRAIN.

BRAIN, n. *brān* [AS. *braegen*; Dut. *brein*; old Dut. *breghe*, the brain: Gael. *breith*, judgment, wit]: a soft, whitish mass inclosed in the skull of man or animals, in which the spinal marrow and all the nerves terminate; the understanding; imagination: V. to kill by dashing out the brains. **BRAIN'ING**, imp. **BRAINED**, pp. *brānd*. **BRAIN-PAN**, the skull containing the brains. **BRAIN-SICK**, a disease in the understanding; giddy; addle-headed. **BRAIN-SICKLY**, ad. in a brain-sick manner. **BRAIN'LESS**, a. without understanding. **BRAIN'ISH**, a. hot-headed. **No BRAINS**, no understanding; witless.

BRAIN: the nervous centre in which reside consciousness and power over the voluntary movements of the body. It consists of one or more masses of *gray* and *white* nervous matter, technically called vesicular and tubular neurine. When these substances are blended, the mass is termed a *ganglion*, and from it proceed prolongations of the tubular matter, called nerves, conductors of impressions to or from the vesicular neurine. The number and size of these ganglia vary with the powers of the animal. In the lowest forms of mollusk we find a single ganglion, from which proceed all the nerves of the animal; in the higher there are two ganglia, joined by a nervous cord round the gullet, and distinct from, though connected with, the ganglion which supplies nerves to the foot, and the one for the respiratory apparatus. In the common slug, we have these cephalic ganglia united so as to form one bilobed mass or B. above the esophagus.

In the **ARTICULATED ANIMALS** (q. v.), the B. consists of two cephalic ganglia over the esophagus; there are also two nervous cords, one on each side of the body connected with each other. In the *Cephalopoda*, as the pearly nautilus, the B., or mass of nervous matter situated over the gullet, is a transverse *cord-like* ganglion; in the cuttle-fish (*Sepia officinalis*) it is a distinct rounded mass, supported by a rudimentary skeleton. In **FISHES**, instead of one supra-esophageal mass or ganglion, there are several separate masses, nerves ending in their own special ganglia; i.e., where each nerve ends or begins in the B., there is a collection of vesicular neurine. In addition to these ganglia in fishes, there are parts cor-

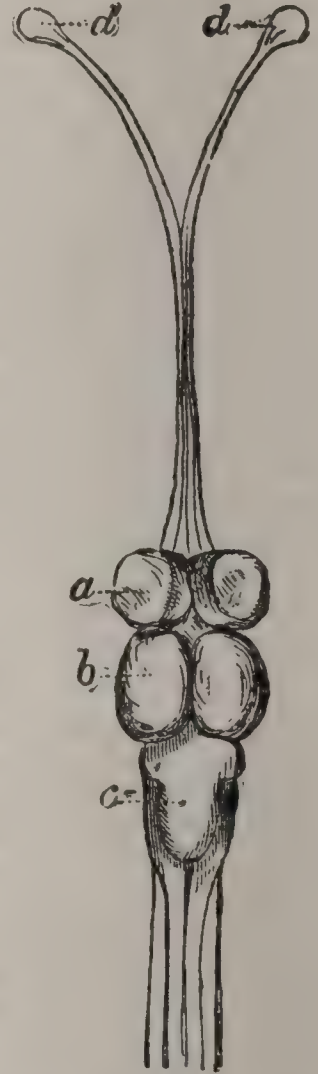


Fig. 1.—Brain of Cuttlefish

Drawn *in situ*—shown by removing roof of skull.

a, cerebral lobes, or hemispherical ganglia; b, optic ganglia; c, cerebellum; d, d, olfactory ganglia, or bulbs, connected to brain by long prolongations or roots.

BRAIN.

responding to the cerebral lobes or hemispheres of the human brain. There is also a cerebellum.

Examining a cod's brain (fig. 1), and first removing the roof of the skull, we see three pair of neurine masses; two small and round in front, *a*, the hemispherical ganglia; two larger in the middle, the *optic* ganglia, *b*; and a little triangular appendage behind, the cerebellum, *c*. From just in front of the anterior of those three pairs of masses diverge nervous prolongations, which end in two bodies, *d, d*, called the *olfactory* ganglia. On lifting the appendage named cerebellum, we see on each side of the spinal cord a deposition of neurine, which represents the *auditory* ganglia of more fully developed brains. The olfactory ganglia vary in their distance from the general mass. In *REPTILIA*, they are very near the cerebral hemispheres, which are small, as is also the cerebellum. But in *BIRDS* (fig. 2), the size of the cerebral lobe, *a*, in proportion to all the other parts is much increased, so that they overlay the different ganglia, which are not placed one in front of the other, as in fishes and reptiles, but packed one above the other. Birds show also some i

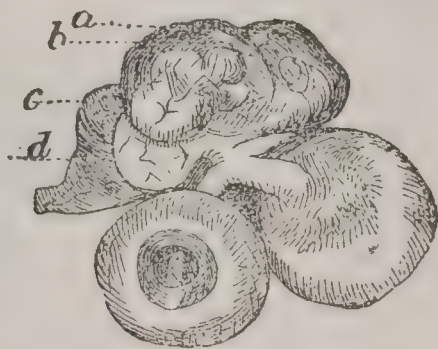


Fig. 2.—Brain of Domestic Fowl:

a, cerebral ganglia; *b*, olfactory ganglia; *c*, cerebellum; *d*, optic ganglion of the right side, seen under cerebral ganglion. The optic nerves and eyeballs have been left in the preparation.

dications of *convolutions*. On the surface of the B. in the paroquet, Leuret describes the furrowing as distinct, though many birds have perfectly smooth hemispheres; these also are not hollow, as in fishes and reptiles; and it will be seen that the convoluting or folding of the B. substance backward and forward must allow of more being packed into the space than could be admitted by any other arrangement. The middle part of the cerebellum is very large, *c*, and divided into laminæ or leaflets; its lateral portions are much smaller than in *Mammalia*; the olfactory ganglia are small, *b*, and close to the cerebral hemispheres. The optic ganglia and other nerves rising from them are very large, and the wedge-shaped portion, called *medulla oblongata*, connecting the B. with the spinal cord, is also large. In the *MAMMALIA*, and in the *Monotremata*, which in some important respects resemble birds—the *Ornithorhynchus paradoxus*, for instance—are found small smooth hemispheres in a B. which to the whole body bears the proportion only of 1 to 130. Even this is

BRAIN.

greater than in the Marsupials; the kangaroo's B. is as 1 to 800.

Examining a rabbit's B., we find it to consist, apparently, of three parts—the *olfactory bulb*, the *cerebral hemispheres*, and the *cerebellum*. The cerebral hemispheres are connected by a transverse band of union, or what is technically termed a *commisure*. Continuing the dissection, we turn aside the hemispheres, and find they have concealed *four ganglia*, which represent the single pair of optic ganglia found in birds. There are two other bodies in front of those just alluded to—viz., the *optic thalamus*, and in front of it another (inferior) *longitudinal commisure*. This forms a

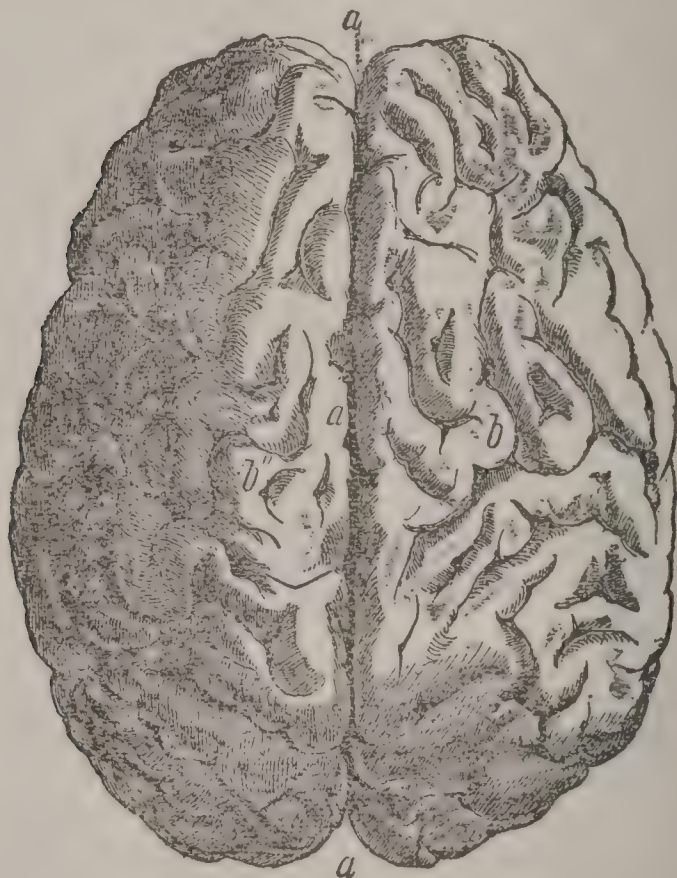


Fig. 3.—Human adult Brain:

Seen from above—membranes removed.

a, a, a, the longitudinal fissure, separating the two hemispheres, **b, b**.

communication between the anterior and posterior portions of the hemisphere, on the same side. Two little white lines, running from the back of the thalami, join a little body called the *pineal gland*, interesting in connection with some fantastic physiological theories. It will be observed that the hemispheres lie over these structures like a cap; the space between the two, on each side, is termed the *lateral ventricle*.

We come now to consider the most complicated B., the human encephalic mass of ganglia (figs. 3, 4, 5), including with it the *medulla oblongata*, the link which unites the B. to the spinal cord. First viewing the B. from its upper surface (fig. 3), we see that it is divided by the longitudinal

BRAIN.

Assure into two equal halves or hemispheres, broader behind than in front. They are irregularly marked by convolutions, *b*, and a smooth appearance is given to the whole surface by the glistening arachnoid membrane (q.v.). On

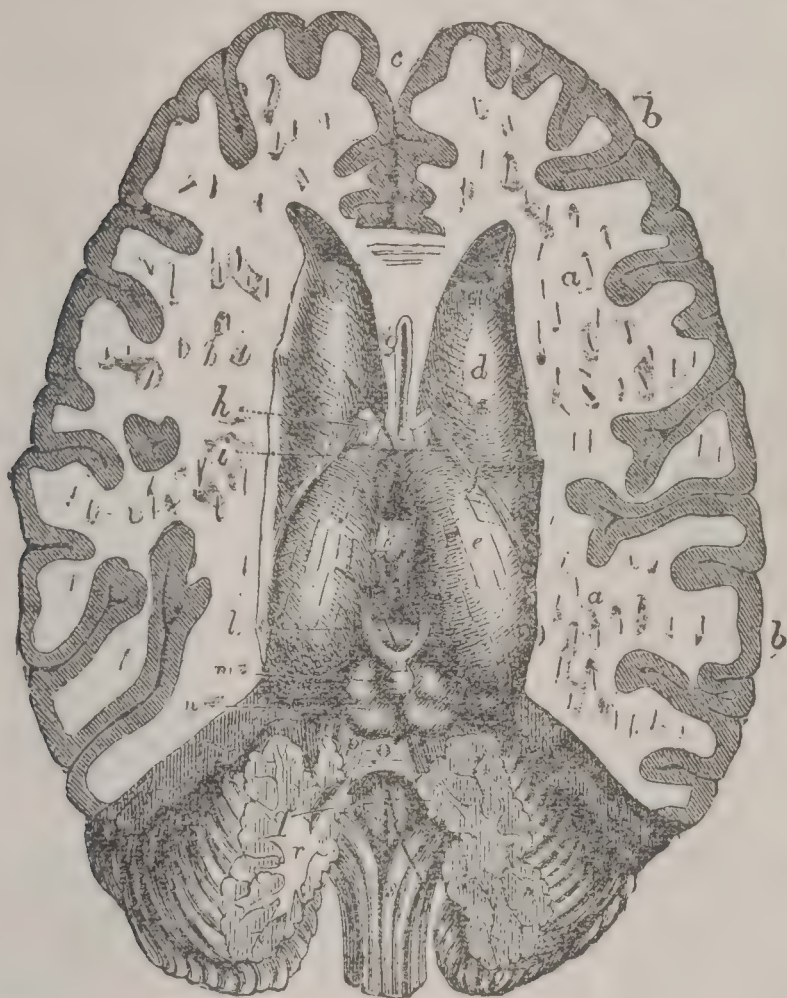


Fig. 4.—Human adult Brain:

In this dissection the cerebral lobes have been sliced off, and the lateral ventricles opened; to allow a view of the cerebellum, the posterior part of the cerebrum has been cut off opposite *n*.

a, a, remains of white oval centre; *b, b*, gray outer portion of hemispheres; *c*, longitudinal fissure; *d*, corpus striatum, or streaked body, lying in lateral ventricle; *e*, optic thalamus, *f*, tænia semicircularis, or worm-like body; *g*, the two layers of septum lucidum, open to show fifth ventricle; *h*, anterior crura, or portions of the fornix, one of the great antero-posterior commissures; *i*, points to the foramen of Monro, a bristle is sticking down into the third ventricle; *k*, is the middle, or soft transverse commissure, joining the two optic thalami—sometimes absent, and easily destroyed; *l*, a bristle passed from the third to the fourth ventricle (*q*), the transverse lines beneath it indicate the posterior transverse commissure; *m*, the pineal gland, lying on *n*, the corpora quadrigemina; *o*, valve of Vieussens, a layer of gray matter from cerebellum; *p*, processes which connect the cerebellum to corpora quadrigemina; *q*, section of cerebellum line, points to gray matter in fourth ventricle; *r*, white matter projecting into the gray, giving a toothed or arborescent appearance, hence the name, arbor vitæ; *s*, posterior pyramids, or back of medulla oblongata.

slicing them transversely with a knife, the section appears white in the centre, and gray at the margins of the *convolutions*, which are now seen penetrating to various depths below the surface. The white substance is dotted with the blood-vessels which supply the brain. On drawing the

BRAIN.

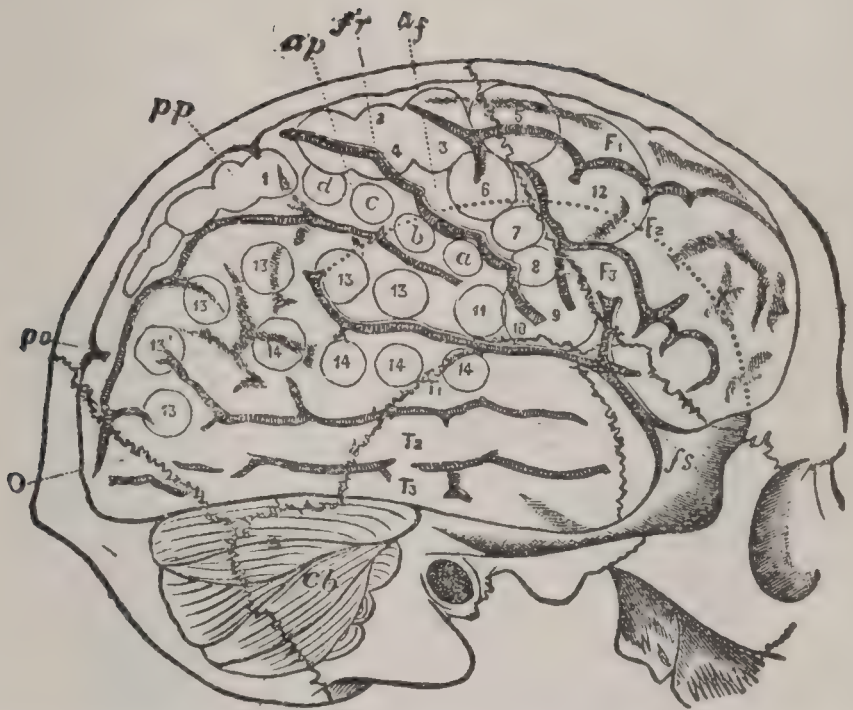
hemispheres asunder from each other with the fingers, the great commissure, or uniting band, is seen, the *corpus callosum*, which is streaked both longitudinally and transversely. The hemispheres should now be completely sliced off on a level with this commissure, and its transverse fibres will be seen to extend into their substance, constituting a large white surface, called by anatomists the *white oval centre*.

If we take the handle of the knife, and scratch with it through this white substance, the instrument soon opens a cavity, which is the *lateral ventricle* (fig. 4). Let this be done on both sides, and the ventricles exposed to view. They are shaped somewhat like the italic *S*. Their extremities are termed cornua, and the anterior look from each other, and are nearer than the posterior, which are turned the opposite way. We have now removed the hemispherical ganglion, and uncovered the others. The pia mater, which supports the vessels bringing blood to the B. substance, is seen in a purple wreath lying in each ventricle, and passing down into a depression termed the *middle horn* of the ventricle. This is the *choroid plexus*, and, if lifted, it will be found continuous with that on the opposite side, through an aperture called the Foramen of Monro, *e*, after the great Scotch anatomist of that name. If the remains of the corpus callosum are now scraped away, the choroid plexus will be found continuous with a web of pia mater called the *velum interpositum*, which lies over the central cavity of the P, or third ventricle. In front and behind will be seen portions of the inferior longitudinal commissure or *fornix*, *f*, the body of which has been removed to show the velum; but, placed vertically between its anterior part and the under surface of the corpus callosum, are two layers of gray matter, between which is a narrow space termed the *fifth ventricle*, *g*. Behind, there will be seen a small hole, through which a probe will pass into the *fourth ventricle*, *h*.

The accompanying cut (fig. 4) shows the parts now exposed. The mass most in front is the *corpus striatum*, *d*; behind it is the *optic thalamus*, *e*. Through the former, motor fibres pass from the anterior columns of the spinal cord into the hemisphere; through the latter, the sensory fibres from the posterior columns of the cord. These are by some considered the ganglia of motion and common sensation.

Behind these are the *corpora quadrigemina*, *n*, which are analogues of the optic ganglia of the lower animals. Upon them lies the *pineal gland*, *m*, and behind them, projecting into the fourth ventricle, *q*, some gray matter, said to be the auditory ganglia. We now come to the upper surface of the *cerebellum*, consisting of two hemispheres split transversely into leaflets, and connected by a central portion to each other, and by two bundles of white fibres to the corpora quadrigemina, *p*. Between these is the *fourth ventricle*; and stretched across between them is a thin layer of gray matter, called the *valve of Vieussens*, *o*.

We now turn what remains of the B. upside down, and examine the base or under surface. It is very irregular



Outer Aspect of Brain, showing relation to the Bones of the Skull, and the Position of Ferrier's Areas (Landois): *fr*, Fissure of Rolando; *fs*, fissure of Sylvius; *po*, parieto-occipital fissure; *F1*, superior, *F2*, middle, *F3*, inferior frontal; *af*, ascending frontal convolution; *ap*, ascending parietal; *pp*, postero-parietal convolution; *T1*, superior, *T2*, middle, *T3*, inferior temporo-sphenoidal convolution; *O*, occipital lobe; *cb*, cerebellum; 1 (postero-parietal convolution), advance of the opposite leg, as in walking; 2, 3, 4 (round upper extremity of fissure of Rolando), complex movements of opposite leg, arm, and of the trunk, as in swimming; *a*, *b*, *c*, *d* (ascending parietal convolution), individual and combined movements of the fingers and wrist of the opposite hand, or prehensile movements; 5 (posterior end of superior frontal convolution), forward extension of opposite arm and hand; 6 (upper part of ascending frontal convolution), supination and flexion of opposite fore-arm; 7 (median part of ascending frontal convolution), retraction and elevation of opposite angle of the mouth; 8 (lower part of ascending frontal convolution), elevation of ala nasi, and upper lip, with depression of lower lip; 9 and 10, opening of mouth with protrusion and retraction of tongue—on the left side is aphasic region; 11, between 10 and lower end of ascending parietal convolution, retraction of opposite angle of the mouth, the head turns slightly to one side; 12, posterior part of the superior and middle frontal convolutions (eyes open widely, pupils dilate, head and eyes turn toward opposite side); 13, 13' (supra-marginal and angular gyrus), eyes move toward opposite side, or upward and downward (centre for vision); 14, superior temporo-sphenoidal convolution (centre for hearing).

BRAIN.

in outline. The cerebral hemispheres are now found divided on each side by a *fissure* (*Sylvian*), *f*. The part in front is called the *anterior lobe*; that behind the *middle*, as far as the cerebellum, when it is called the *posterior lobe*.

The diagram (fig. 5) gives a better idea of the appearance than words could possibly do. The olfactory lobes, *h, h*, are now seen lying in a fissure in the anterior lobes. The

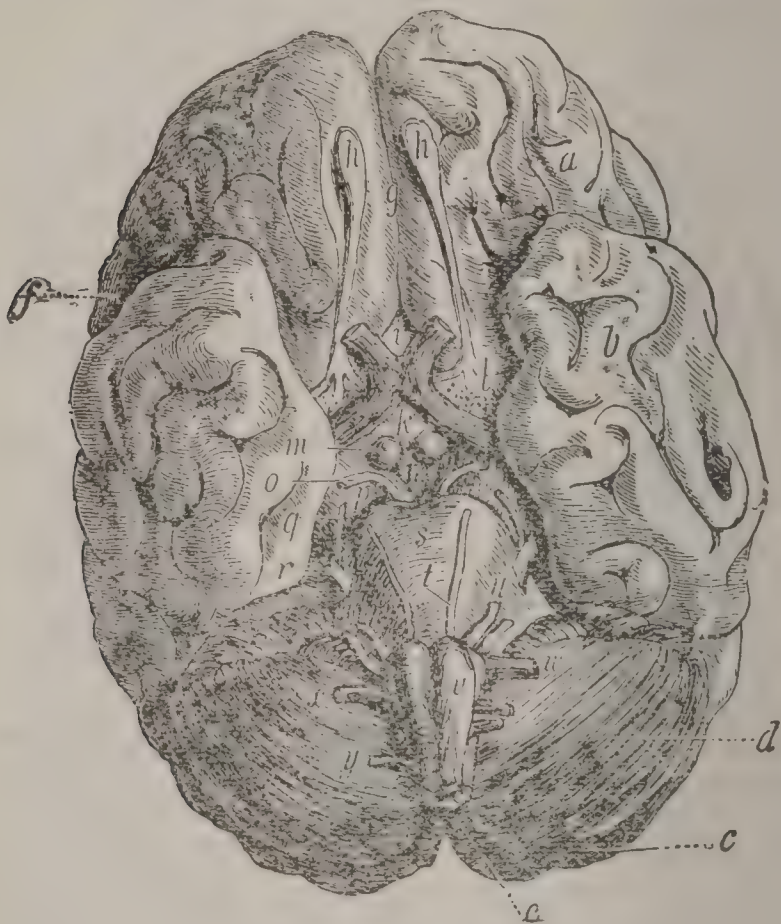


Fig. 5.—Human adult Brain:

a, anterior lobe of cerebrum; *b*, middle lobe; *c*, posterior lobe of cerebrum, appearing behind; *d*, cerebellar hemisphere; *e*, medulla-oblongata; *f*, fissure of Sylvius; *g*, longitudinal fissure; *h, h*, olfactory bulbs; *i*, optic commissure—the optic nerves are seen interchanging fibres; *l*, three roots of olfactory process; *m*, white round bodies (*corpora albicantia*), the terminations of the anterior portions of fornix; *n*, where the vessels perforate the brain substance, hence called posterior perforated space; *o*, third pair of nerves coming to supply muscles of the eyeball, from *p*, the crus cerebri; *q*, fourth nerve, turning round from the valve of Vieussens; *r*, fifth pair; *s*, pons varolii; *t*, sixth pair of nerves; *u*, seventh pair, portio dura for muscles of face, and portio mollis for hearing; *v*, posterior pyramids of cerebellum, seen to interchange fibres; *w*, and two below, are eighth pair—viz., glossopharyngeal, vagus pneumo-gastric, and spinal accessory nerve; between *w* and *v* is the small prominence called olivary body; *x, y*, two roots of ninth pair of nerves, motor nerve of tongue.

optic tracts are seen meeting at their commissure, *i*, in interchanging fibres, and passing on as the optic nerves to the orbit. The larger bundles behind, and directed outwards, are the *crura cerebri*, *p*, passing toward the hemispheres, emerging from the transverse mass called the *pons varolii*, *s*, which lies like a clamp between the two halves of the cere-

BRAIN.

bellum, *d*. From the inner side of each crus arises the third nerve, *o*, destined to supply four of the muscles which move the eyeball. The fourth nerve, *q*, comes from the valve of Vieussens, and is seen on its way to supply the superior oblique muscle which turns the eye upward and outward, hence called *patheticus*. From each side of the pons the fifth pair, *r*, arises; the sixth, *t*, between the pons and the anterior pyramids of the medulla oblongata; *w* is the eighth, consisting of: 1. The Glosso-pharyngeal, or nerve of deglutition; 2. The Pneumo-gastric distributed to the respiratory apparatus and stomach; and with it, 3. The Spinal Accessory.

The chemical composition of B. matter averages in 100 parts—

Water.....	75½ parts.
Albuminous matter.....	7 “
Fat.....	11½ “
Salts (containing 1½ of phosphoric acid)...	6 “

The proportion of these constituents varies not only in different species of animals, but also in different members of the same animal group, and appears much influenced by the age, temper, and intellectual capabilities of each individual. Thus, the normal quantity of salts in the B. of a healthy man is 6 per cent., and in the B. of an insane patient, only 2½ per cent. were found.

Softening of the Brain (ramollissement) is a frequent result of chronic inflammation of the brain. The patient has been for some time in low health, troubled with headaches, loss of appetite, depression of spirits, and a gradual loss of memory, and acute perception of things in general. Then a spasm may occur, followed by paralysis, or the legs and arms may be bent up, and remain in that position. This condition of B. may be caused by want of proper nourishment to the cerebral substance, owing to plugging up, or from disease of its arteries. When the softening is caused by inflammation, pus is frequently found forming an abscess of the brain. Induration also may occur as the result of inflammation.—For the other diseases, such as hydrocephalus, see their titles.

Diseases of the Brain.—*Inflammation* (acute) of the B. (*phrenitis*, or popularly, *B. fever*) rarely occurs separately, and can scarcely be distinguished from inflammation of its membranes (meningitis). According to Dr. Watson of London, when the disease begins in the latter, the first remarkable symptom is a convulsion fit; when in the B. substance itself, nausea and vomiting generally usher in the attack.

In the first stage there is rapid pulse, severe headache, the eyes suffused, and their pupils contracted to a small point, very intolerant of light. The patient is constantly watchful, and much annoyed by even ordinary sounds. Then furious delirium sets in, and lasts for a period, varying with the case, generally 12–48 hours, when it is succeeded by collapse, in which the patient lies in stupor—his face devoid of color, and covered with cold sweat. If roused, he now speaks with slow, indistinct utterance; his

pupils are dilated, and indifferent to the brightest light; and the loudest speaking ceases to annoy him. The stupor increases with the general prostration, and continues till death. After death, serous fluid is found upon and in the B., deposits of lymph, thickening of the membranes, and softening of the B. substance itself.

General and local bleeding, with antimony and digitalis, to subdue the pulse; mercury, to prevent the deposit of lymph; blisters, as counter-irritants, to the back of the head and neck, are the usual remedies for this rare, but terrible disease. The younger school of practitioners, however, prefer waiting to see if nature unaided, or only *gently guided*, will not carry the patient through a disease where the efforts of art are notoriously futile, and are rather content to *watch the symptoms*, to calm excitement by sedatives, to lessen increased heat of body by diluents and tepid sponging, to prevent accumulations in the intestines by purgatives, and to diminish maniacal delirium by the application of cold to the head.

BRAINARD, *brā'nard*, JOHN GARDINER CALKINS: 1796-1828; b. and d. New London, Conn: poet. He graduated at Yale 1815, studied law, and practiced a short time. He was editor of *The Connecticut Mirror* 1822-27, when consumption obliged him to resign; and the following year, he returned to his father's house to die. His contributions to the *Mirror* consisted mainly of poems and articles on literary topics. *Literary Remains*, comprising a second edition of his poems, with the author's life, by J. G. Whittier was published 1842.

BRAIN-CORAL, or BRAINSTONE-CORAL: one of certain kinds of Coral (q.v.) or Madrepora (q.v.), now forming the restricted genus *Meandrina*; named from the resemblance to the brain of man or of a quadruped in their large rounded mass and numerous winding depressions. They are found chiefly in the seas of warm climates, and some attain great size. When the hemispherical mass is broken, the ridges which bound its furrows may be traced inward through its substance even to the central nucleus from which they commenced. The mouths of the polyps, in all the species of this genus, are in the furrows or elongated hollows, in which they are ranged side by side, in sinuous series.

BRAINE, *brān*, DANIEL LAWRENCE: naval officer: 1829, May 18-1898, Jan. 30; b. New-York. Entering the navy 1846, he was in the Mexican war; was promoted lieut. 1858; was in the first naval battle of the war, commanding the *Monticello* at Sewall's Point, Va., 1861, May 19; and rendered important service near Cape Hatteras; was promoted lieut. commander 1862, July 15; and was commander of the *Pequot* in the attacks on Fort Fisher, Fort Anderson, and the Cape Fear river forts. etc., showing cool bravery; commissioned commander 1866, July 25. He was at Brooklyn navy-yard in charge of the equipment dept. 1869-72; capt. 1874, Dec. 11; commodore 1885, Mar. 2; pres. naval board of inspection, New York, 1885, July 1; rear-admiral

BRAINERD—BRAISE.

1886, Aug. 12, commanding the s. Atlantic squadron; retired 1891, May 18.

BRAINERD, *brā'něrd*: city, cap. of Crow Wing co., Minn.; on the Mississippi River, and on the Northern Pacific railroad; 136 m. n.w. of St. Paul. It contains great car and machine shops, with a railroad hospital (cost \$25,000) and sanitarium. The city has co. buildings (\$45,000), high school (\$40,000), 15 churches, opera-house, 1 national bank (cap. \$50,000), 1 state bank (cap. \$25,000), gas and electric light (\$75,000) plants, and 3 weekly and 1 monthly periodicals. Water-power is provided for immense saw-mills by a dam across the Mississippi, which provides also for large storage of logs. Pop. (1900) 7,524.

BRAINERD, *brā'něrd*, DAVID: 1718–47; b. Haddam, Conn.: preacher and missionary to the Indians. He had from childhood deep religious feelings and convictions. B. was expelled from Yale College for attending meetings of the *New Lights*, having augmented the offense by declaring that one of the tutors had no more religion than the chair upon which he sat. In 1742, he was licensed to preach. As a missionary to the Indians, he had wonderful success. He lived in wigwams and endured every hardship until his health failed. Near Freehold, N. J., he baptized 70 persons in one year, more than half being adults. He wrote a narrative of his labors among the Indians in Massachusetts, Pennsylvania, and New Jersey, 1846. These journals under the titles of *Mirabilia Dei apud Indicos*, and *Divine Grace Displayed*, are among the most interesting works of the kind ever written.

BRAINTREE, *brān'trē*: town of Norfolk co., Mass.; 10 m. s.s.e. of Boston, near the shore of Massachusetts Bay, at the junction of the Old Colony, the Granite Branch of the same, and the South Shore railroads. It has a newspaper office, savings bank, several churches, a public library, and the Thayer Acad. with a fund of \$200,000. It is situated in the township of Braintree, which has granite quarries, and manufactures of paper, carpets, boots, shovels, tacks, etc. Pop. of the township (1900) 5,981.

BRAIN'TREE, market-town of Essex, Eng., about 40 m. n.e. from London. It is an old place, having been constituted a market-town by King John. Its streets are narrow, and many of its houses are of wood. It has manufactures of silk, crape, and straw-plait. It is one of the polling-places for North Essex, and has had some notoriety in connection with political and ecclesiastical proceedings. Pop. of parish (1881) 5,182; (1891) 5,303.

BRAIRD, n. *brārd* (A.S. *brord*, a prick or point, the first blade or spire of grass or corn]: in *agri.*, the first appearance of a crop after the seed has been sown, as oats or barley: V. to sprout, as corn. **BRAIRD'ING**, imp. **BRAIRD'ED**, pp.

BRAISE, v., or **BRAIZE**, v. *brāz* [F. *braise*, glowing embers—from Sp. *brasa*, live coal—from old Ger. *bras*; Gael. *brath*, fire]: to both stew and bake in a pan having a close-

BRAIT—BRAKE.

fitting lid of iron for live embers, the meat being thus cooked from above and below: N. the savory viands put with the meat to be braised. BRAIS'ING, imp. BRAISED, pp. *brāzd*: ADJ. cooked by heat both above and below.

BRAIT, n. *brāt* [prov. F. *braed*, to rub or grind down]: a rough diamond.

BRAITHWAITE, *brāth'wat*, WILLIAM. 1807–85: English physician; studied at St. George's Hospital, Leeds. He became licentiate of the Society of Apothecaries 1828, member of the Royal College of Surgeons 1829, and 1830 commenced practice at Leeds, where he was appointed lecturer on midwifery and diseases of women and children at the Leeds School of Medicine. In conjunction with James Braithwaite, M.D., Lond., he published *The Retrospect of Medicine* (London, 1840–1885): a half-yearly journal presenting an account of every important discovery and practical improvement in the medical sciences.

BRAIZE, *brāz*: an excellent salt-water food-fish, commonly called Porgy or Paugie.

BRAKE, n. *brāk* [Gael. *brac*; L. *brachĭŭm*, the arm, as the type of exertion and strength: old Dut. *brake*, a clog: Icel. *braka*, to subdue: It. *braca*, a horse's twitch: AS. *bracan*, to pound or knead: Dan. *brage*, to break flax]: a skeleton carriage for training horses; a long, open carriage; a large, heavy harrow for breaking clods; a kneading-trough; an instrument for checking the motion of a wheel—also spelt BREAK; an inclosure for cattle; a bit for horses; a wooden frame for confining the feet of vicious horses in shoeing. BRAKE-MAN, n. one who manages a brake of a carriage. BRAKE-VAN, n. in *railway trains*, a carriage furnished with powerful *brakes*. BRAKE-WHEEL, in *railroad engin.*, the wheel on the platform or top of a carriage by which the brakes are put in action.

BRAKE, n. *brāk* [Dut. *broeck*, a fen or marsh: Ger. *bruch*, a wood in a marshy place: OF. *broil*, copse-wood, cover for game]: broken ground covered with a tangled growth of bushes. BRAKY, a. *brā'kĭ*, rough; thorny; prickly.

BRAKE, n. *brāk*, or BRACKEN, n. *brāk'ĕn* [connected with last as the natural growth of waste places: W. *bruk*; Gael. *fraoch*, heath: Icel. *brok*, sedge: Dan. *bregne*, bracken or fern]: genus of Ferns. *Pteris* (Gr. *pteron*, wing), distinguished by spore-cases in marginal lines covered by the reflexed margin of the frond. The COMMON B. or BRACKEN (*P. aquilina*) is very abundant in most parts of Europe, often covering considerable tracts; and in many parts of America and Asia, and in some parts of Africa. It has a long, creeping, black rhizome, or root-stock, from which grow up naked stalks of 8–18 inches in height; each stalk divides at top into three branches; the branches are bipinnate, the inferior pinnules pinnatifid. The root-stock, when cut across, exhibits an appearance which has been supposed to resemble a spread eagle, whence the specific name *aquilina* [Lat. *aquila*, an eagle]. The root-stock is bitter, and has been used as a substitute for hops: it has

BRAKE.

also been ground, mixed with barley, and made into a wretched bread in times of famine. The plant is astringent and anthelmintic; and as such, it had at one time a high reputation, although now little used by medical practitioners. It is employed in dressing kid and chamois leather. The ashes, containing a large quantity of alkali were formerly used in the manufacture of soap and of glass, so that the collecting of them for sale was a considerable resource of the poor in some parts of the Hebrides. B. is used also for thatching, for littering cattle, etc., and occasionally chopped up with straw or hay, for feeding cattle. It forms a favorite covert of deer and of other game; and the word B. often implies a thicket. The abundance of this plant is sometimes regarded as a sign of poor land, though, probably, its absence from the richer



Common Brake:

a, end of a branch, much reduced; *b*, end of a pinnule, the lower side, showing fructification.

soils is very much a result of cultivation. To extirpate it, nothing more is necessary than a few successive mowings of the young shoots as they appear. The annual growth of B. is killed by the first frosts of autumn, but remains rigid and brown, still affording shelter to game, and almost as characteristic a feature in the landscape of winter as in that of summer, perhaps adding to its general desolateness.—*Pteris caudata*, a large species of B. very similar to that of Europe, is one of the worst pests which the farmer has to contend with in the south of Brazil.—*Pteris esculenta*, native of New Zealand, Van Diemen's Land, etc., has a more nutritious rhizome than the common brake. See TARA FERN.—Rock B. (*Cryptogamma crispa* or *Allosorus crispus*, formerly *Pteris crispa*) is a pretty little fern, common on stony hills in the n. parts of Britain.

BRAKE—BRAMAH.

BRAKE, *brāk*: contrivance for retarding or stopping motion by friction; applied to the wheels and runners of vehicles, hoisting apparatus, etc. In carriages it generally consists of curved blocks of wood fastened to a beam and pressed against the tires of the wheels by means of a lever worked by hand or foot. In wagons, motion was originally retarded by stopping one wheel altogether, by means of a heavy chain. It was not until about 1840, or a little earlier, that patent brakes came into general use. The introduction of this great improvement was considerably retarded by the notion that the tires of wheels were worn off sooner by brakes than by the use of the log-chain. It is a singular fact, too, that the brake-beams were for about ten years attached to the boxes of the wagons. Inventive genius has continually been busying itself in making improvements until systems of brakes have been developed that satisfy every demand. The farmer may by pressing one finger against a lever stop the heaviest load at the steepest hill; and the engineer by a single turn of his hand can instantly apply such tremendous force upon every wheel as will bring a swift moving train to absolute rest in a few seconds. Air-brakes are now in general use on railroads. Under every car there is a cylinder and piston, connected with a combination of levers and rods under control of the engineer, that set brakes against all the wheels. All the cylinders are connected by tubes with a reservoir for compressed air near the locomotive, and filled by a special engine acting automatically. Another system substitutes a vacuum for compressed air.

BRAMA, *brā'ma*: genus of fishes of the Hen-fish family, *Bramidae*. *B. Rasi*, called Pomfret in Bermuda, has been seen at the Newfoundland Banks, is common on the coast of Wash. and Vancouver's Island; also on the w. coast of S. America and in the Mediterranean; and occasionally on Brit. shores, where it is one of the fishes called Bream, and, mistakenly, Gilt-head. The genus *B.* has the body very deep and compressed, the head rather obtusely terminated, a single elongated dorsal fin, and the anal fin with a very lengthened base. The tail is forked, its points extremely divergent. This fish is sometimes more than two ft. in length. Its flesh is of exquisite flavor.

BRAMAH, *brā'ma*, **JOSEPH**: practical machinist: 1743, Apr. 13—1814, Dec. 9: b. Stainborough, Yorkshire; son of a farmer. He early showed unusual talent for mechanics. Incapacitated in his 16th year from agricultural labors by an accidental lameness, he was apprenticed to a carpenter and joiner, and afterward obtained employment with a cabinet-maker in London. Subsequently, he established himself in business in the metropolis, and became distinguished for the number, value, and ingenuity of his mechanical inventions, such as safety-locks, and improvements in pumps and fire-engines, in the construction of boilers for steam-engines, in the processes of making paper, in the construction of main-pipes, wheel-carriages,

the beer-machine used at the bar of public-houses, and many others. in 1795 he patented the hydrostatic press known by his name: see HYDRAULIC PRESS. In all he took out about 20 patents.

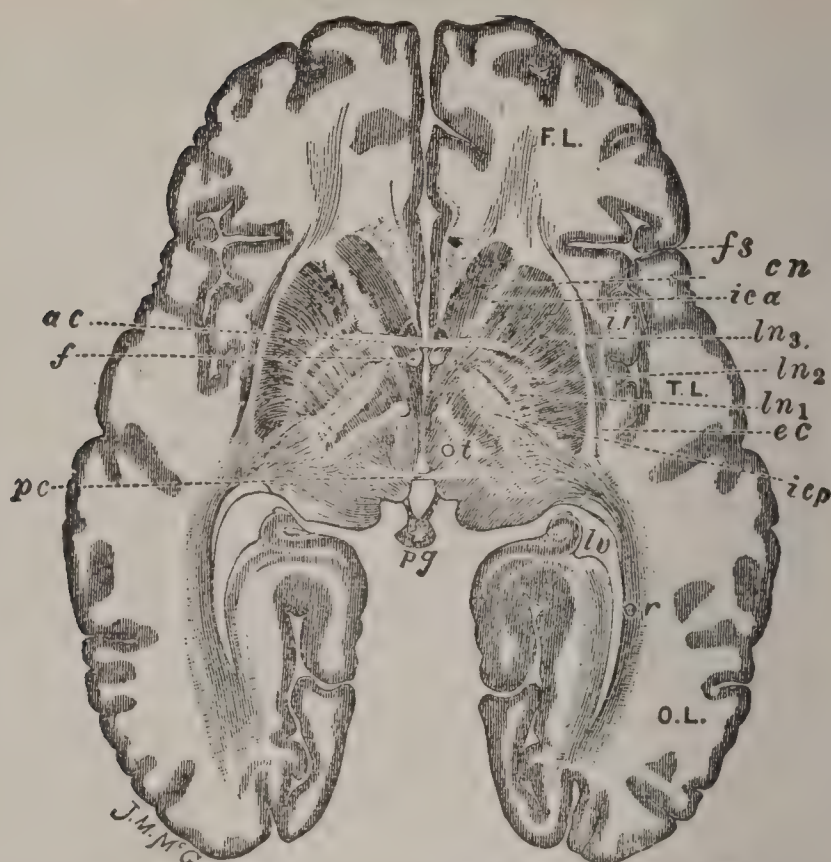
BRAMAH-PRESS, *brā'ma-prēs*: a hydrostatic press of immense power, so named after the inventor, Joseph Bramah (q.v.).

BRAMANTÉ, *brá-mán'tā*, DONATO LAZZARI: 1444-1514; b. Monte-Asdroaldo, in the duchy of Urbino: Italian architect and painter. From 1476-99, he resided in Milan, where he studied geometry and perspective, neither of which sciences was well understood by artists in his day. He was noted as one of the best painters in Lombardy; but his success in architecture eclipsed his fame as a painter. In Milan, he built the choir of Santa-Maria delle Grazie, and the church of Santa-Maria presso San-Satiro. After the fall of Ludovico Sforza, B. went to Rome, where he was employed first by the pope Alexander VI., afterward by Julius II. The first great work which he undertook for the latter was to connect the Vatican palace with the two pavilions of the Belvedere by a series of immense galleries; the second was the rebuilding of St. Peter's Church, of which he laid the new foundation 1506. When only a small portion of his plans had been realized, B. died at Rome, and succeeding architects departed widely from the original design of a grand cupola over a Greek cross. Among other works of B. in Rome may be mentioned the palaces Cancellaria and Giraud (now Torlonia), in which he adhered more strictly than in other works to antique forms but not without a characteristic grace in his application of these.

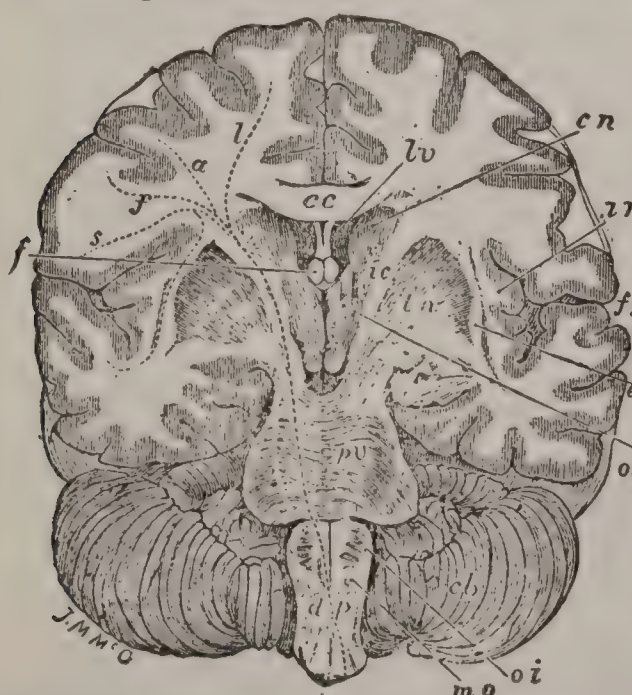
BRAMBANAN, *brām-bá'nân*: district of the province of Soorakarta, Java, rich in remains of Brahmanical temples, superior in magnificence to any in India. The edifices are composed entirely of hewn stone, and no mortar has been used in their construction. In all, there are 296 temples, disposed in five parallelograms one within the other. The outer one consists of 84 temples; the second, of 76; the third, of 64; the fourth, of 44; and the inner one, of 28. In the centre stands the largest and most imposing structure of all. It is 90 ft. high, and profusely decorated with mythological figures, in a moderately good style of art.

BRAMBLE, n. *brām'bl* [AS. *bremel* or *brembel*; Dut. *braeme*, *bramble*: Swiss, *brom*, a bud: It. *bromboli*, cabbage-sprouts]: any thorny growth or prickly shrub; a creeping shrub, very rough and prickly, producing a black berry like the raspberry; the *Rubus fruticōsus*, ord. *Rosācēæ*: see BLACKBERRY. BRAMBLED, a. *brām'bld*. BRAMBLY, a. *brām'blī*, full of brambles. BRAM'BLING, n. the mountain finch.

BRAM'BLING, or BRAMBLE FINCH, or MOUNTAIN FINCH (*Fringilla Montifringilla*; see FINCH and FRINGILIDÆ): bird nearly allied to the Chaffinch (q.v.). It is a little larger than the chaffinch, which it much resembles



Brain.—Transverse Section of Cerebrum in plane of line CD (Pl. 29, fig. 3): F.L., Frontal; T.L., temporal; O.L., occipital lobes; *fs*, fissure of Sylvius; *ir*, island of Reil; *cn*, caudate nucleus; *ln1*, *ln2*, *ln3*, the three divisions of the lenticular nucleus; *ica*, anterior limb of internal capsule; *icp*, posterior limb of internal capsule (the anterior part conveys motor, the posterior part sensory fibres), the part generally injured in cerebral hemorrhage; *ot*, optic thalamus; *or*, optic radiation, probably conveys sensory fibres to occipital and temporal lobes; *ac*, anterior commissure, connects both temporal lobes; *f*, fornix; *pc*, posterior commissure; *pg*, pineal gland; *lv*, lateral ventricle (posterior horn).



Vertical Transverse Section of Brain in direction of line AB (Pl. 29, fig. 3). The shaded outline of cerebrum indicates the superficial gray matter. *fs*, Fissure of Sylvius; *ir*, isl and of Reil, a convolution at the bottom of the fissure of Sylvius concealed in the adult; *cc*, corpus callosum, the transverse interhemispherical commissure; *lv*, lateral ventricle; *f*, fornix, divided transversely. Between the fornix and the corpus callosum are seen the thin septa lucida; *cn*, caudate nucleus; *ln*, lenticular nucleus (with its three divisions); *ot*, optic thalamus; *ic*, internal capsule; *ec*, external capsule, and outside it a layer of gray matter, the claustrum; *pc*, pons Varolii; *mo*, medulla oblongata; *oi*, inferior olivary body; *cb*, cerebellum; *l*, *a*, *f*, *s*,

mark the origin of the dotted lines representing motor fibres passing from the leg, arm, face, and speech 'centres,' through the internal capsule, cerebral peduncles, pons Varolii, medulla oblongata, and crossing at *dp*, the decussation of the pyramids to the opposite side of the spinal cord (to explain crossed paralysis). Another dotted line passes from *s* (speech centre) to hearing centre in first temporal convolution.

BRAMPTON—BRAN.

in general appearance, its bill, and even the disposal of its colors. The tail is more forked. In the males, the crown of the head, the cheeks, the back and the sides of the neck, and the upper part of the back, are mottled in winter with brown and black; but in spring the whole of these parts become a rich velvety black; the throat and breast are of a rich fawn color, which is also the prevailing color of the wings; but they are crossed, when closed by an oblique band of jet-black, and by another oblique band of white. The quill-feathers also are black, edged with yellow on their outer webs; the tail-feathers black, edged with reddish white; the rump and the belly are white; a small tuft of feathers under each wing and some of the lower wing-coverts are bright yellow. The B. is a mere winter visit-



Brambling, or Mountain Finch.

ant in Britain, and the period of its arrival appears to vary according to the severity or mildness of the weather in the more northerly regions. The B. has never been known to breed in any part of the British islands, and even in the s. of Sweden it is a mere winter visitant. It breeds in the more northerly parts of Scandinavia. It has no song, its call-note is a single monotonous chirp. It is very widely distributed, being found as far e. as Japan, and, in its winter migrations, visiting Italy, Sicily, Malta, Smyrna, etc.

BRAMPTON, *brämp'tun*: very ancient town in the county of Cumberland, near the Arthing, 8 m. e.n.e. of Carlisle. It is surrounded by hills; and the Castle hill commands a very extensive view. The chief manufacture is the weaving of checks and gingham; and there are coal-mines in the vicinity. On a rock, two m. to the s., is a Roman inscription, supposed to have been cut by one of Agricola's legions A.D. 207. Two m. to the east stands Lanercost Abbey, founded 1116. Pop. (1891) 5,404.

BRAN, n. *brän* [Bret. *brenn*; W. *bran*; It. *brenna*; F. *bran*—from F. *bren*, excrement, ordure—from Gael, *bran*, chaff, husks]: the husks or shells from ground wheat; the husks of any grain. BRANNY, a. *brän'nî*, consisting largely

of bran; presenting the appearance of bran or small scales.

Bran is obtained from the outer covering or husks of grain during the process of grinding, and is separated from the finer flour before the latter is made into Bread (q.v.). It is in the form of thin, scaly, yellowish-brown particles, with sharp edges. Bread, known as Brown Bread, is sometimes made from flour containing bran. B. is used also in brightening goods during the process of Dyeing (q.v.) and in Calico-printing (q.v.). In med. B. is applied in poultices to relieve sprains, inflammation, etc.; and an infusion is used as an emollient footbath. The principal use of B. is for feeding to live-stock. For this purpose it is valuable not only for the nutritive matter which it contains, but also for its richness in mineral elements which make the manure of animals fed with B. an efficient fertilizer. The average of many analyses gives the percentages of digestible nutrients of B. as follows:

Albuminoids	12·6
Carbo-hydrates	42·7
Fat.....	2·6

It is well to feed B. in connection with materials containing larger proportions of starch and fat.

BRANCALEONE, *brán-kâ-lâ-o'nâ*, DANDOLO, Count of Casalecchio, *kâ-zâ-lěk'ke-o*: 13th c.; b. Bologna: Italian nobleman, invested with the powers of dictator, in order to suppress anarchy and restore law and order in those troubled times. Having received the terrible mission of crushing feudalism, 1253, he besieged in their castles the nobles and their hirelings, seized alike gentleman and free-booter, and razed to the ground 140 fortresses. He set a limit even to the temporal power of Pope Innocent IV., and was driven from Rome, but recalled two years afterward. He died 1258, hated by the nobility but beloved by the people.

BRANCH, n. *brănsă* [Bret. *brank*; It. *branca*; F. *branche*, the branch of a tree: It. *branca*, the fang or claw of a beast]: the shoot of a tree or plant: an arm: any part of a body or system; a descendant from a common parent: V. to divide into parts; to spread out. BRANCH'ING, imp.: ADJ. spreading in branches. BRANCHED, pp. *brănsht*. BRANCH'-LESS, a. without shoots or branches. BRANCHY, a. *brănsă'î*, full of branches. BRANCH'INESS, n. the state or condition of abounding in branches. BRANCH-CHUCK, a chuck having four branches, each of which has a screw whose end may be made to impinge upon the object. BRANCHED-WORK, in *arch.*, carved or sculptured branches or leaves in monuments or friezes. BRANCH'LET, n. a little branch. ROOT AND BRANCH, wholly; totally.

BRANCH, in Botany: a part of a tree or other plant not taking its rise immediately from the root, but rather forming a sort of division of the stem, and often divided into secondary branches, again, perhaps, further much ramified into *branchlets* and twigs, the ultimate ramifications

BRANCHIÆ—BRAND.

producing leaves, flowers, and fruit. Branches originate in leaf-buds, which are produced at the *nodes* of the stem, or of the already existing branches. See BUD: PLANT: STEM. The buds being formed in the axils of leaves, the arrangement of the branches as alternate, opposite, whorled, etc., varies like that of the leaves, but buds often remain dormant, according to a regular law of alternation. The angles of ramification are very different in different plants, producing great variety of appearance, and giving marked characteristics to different kinds of trees; instance, great difference between the ramifications of the *Coniferæ* (pines and firs) and that of other trees. In many herbaceous plants whose axis is scarcely developed into a stem, instead of branches there proceed from the lateral buds *runners*, which lie close to the ground, send down roots, and produce new plants, as in the strawberry.

BRANCHIÆ, n. plu. *bräng'kĩ-ē* [Gr. *branchia*, the gills of a fish]: the gills or breathing organs of animals living entirely in water: see GILLS. BRANCHIAL, a. *-kĩ-āl*, relating to the gills of fishes. BRANCHIOPODA, n. plu. *bräng'kĩ-ōp-ō-dā*, also BRANCHIOPODS, n. plu. *-kĩ-ō-pōdz* [Gr. *podes*, feet]: crustacean animals having gills attached to the feet. BRANCHIOPODOUS, a. *-ōp'ō-dūs*, gill-footed. BRANCHIOSTEGAL, a. *-kĩ-ōs'tē-gāl*, or BRANCHIOSTEGOUS, a. *-tē-gūs* [Gr. *stego*, I cover]: gill-covering—applied to certain bones or bent rays which support the membrane covering and protecting the gills of fishes. BRANCHIATE, a. *bräng'kĩ-āt*, possessing gills or branchiæ. BRANCHIFERA, n. plu. *bräng'kĩ-fēr-ā* [L. *fēro*, I carry]: a division of gasteropodous mollusks in which the respiration is aquatic, and the respiratory organs are mostly in the form of distinct gills.

BRANCHIOPODA, *bräng'kĩ-ōp'ō-dā* [Gr. gill-footed]: order of *Crustacea* (q.v.), including Ostracoda, Cladocera, and Phyllopoda, the first two sub-orders, and part of the third, with a bivalve carapace; they breathe by their flattened legs. They are all small creatures, many almost microscopic, and abound chiefly in stagnant fresh waters. Some are popularly known by the name of Water-fleas (q.v.); the Brine-shrimp (q.v.) is another example; and the genera *Daphnia* and *Cypris* may be mentioned, the former on account of its great frequency in stagnant fresh waters, the latter because its hard shells resist decomposition, and are therefore abundant in a fossil state.

BRANCO, Rio, *rē-o brán'ko*: river of that portion of Brazil which, originally comprised within the understood limits of Guiana, lies n. of the Amazon. It rises in the Parime Mountains, on the very borders of Venezuela; and after a s. course of about 400 m., it joins, near lat. 1° 20' s., long. 62° w., the Rio Negro, of which it is the principal tributary, on its way to the Amazon.

BRAND, n. *bränd* [Icel. *brandr*; Ger. *brand*, a burning fragment of wood, a sword-blade: It. *brandone*, a large piece of anything]: a burning piece of wood; a sword—so named from its glittering as a flaming torch when moved

BRAND—BRANDENBURG.

about; a stake of burning wood as taken from the fire and extinguished: a mark made by pressing a hot iron mold, as on a barrel: see FISHERIES; a trade-mark: see TRADE-MARKS; a mark of infamy; a stigma: V. to burn or mark anything with an iron mold red-hot; to fix a mark of infamy on any one; to stigmatize. BRAND'ING, imp.: ADJ. stamping as with a brand. BRAND'ED, pp. BRAND'-IRON, or BRANDING IRON, n. an iron mold to brand with. BRAND-NEW, a. bright and fresh, as the glitter of a flaming torch; fresh like a newly impressed trade-mark. BRANDLING, n. *bränd'ling*, a red worm used by anglers; a fish. BRANLIN, n. *brän'lin*, a fish of the salmon kind.

BRAND: name given in some parts of Britain to some of those diseases of plants, especially of corn-plants, which are called also BLIGHT, BUNT, MILDEW, RUST, and SMUT: (see these titles). It is the German name for the disease generally known in Britain as BUNT, sometimes as *Pepper-brand*. Both as a German and an English word, it seems derived from the verb *brennen*, to burn, and to refer to the burnt appearance produced by the diseases. Its most common application in Britain, however, is not to the diseases already mentioned, but to a peculiar spotted and burnt appearance often seen on the leaves, and sometimes also on the bark of plants, which does not seem connected with the presence of parasitic fungi, but which sometimes becomes so extensive as to cause the death of the plant. The nature of this disease is still somewhat obscure. Occurring most frequently when warm sunshine succeeds to moist weather or to hoar-frost, and frequently affecting plants in hotbeds upon which drops of condensed moisture fall from the frame, it has been ascribed to the concentration of the sun's rays by the drops of water on the leaf or bark—a theory utterly untenable, as no concentration can take place in such circumstances. The probability appears to be, that the action of the moisture unequally distributed, and particularly when sudden changes of temperature take place, deranges the vegetable functions and destroys the fine tissues.

BRANDE, *bränd*, WILLIAM THOMAS: 1788–1866; b. London: English chemist, fellow of the Royal Soc., successor of Sir Humphrey Davy in the chair of chemistry in the Royal Institution, 1813. He was joint editor with Faraday of the *Quarterly Journal of Science and Art*, 1816–33. He acquired renown as a lecturer, and published a *Manual of Chemistry*, translated into French, German, and Italian; and 1842 took the superintendence of the *Dictionary of Science, Literature, and Art*, an excellent work.

BRANDENBURG, *brän'den bürg*: province of Prussia, in the centre of the kingdom, lat. $51^{\circ} 30' - 53^{\circ} 45'$ n., long. $11^{\circ} 13' - 16^{\circ} 8'$ e.; 15,350 sq. m. It formed the nucleus of the Prussian monarchy, but the modern province does not quite correspond with the old *Mark of B.*, which included also a part of the province of Saxony and of Pomerania, while it lacked certain small portions of territory now con-

BRANDENBURG.

tained in the province of B. Almost the whole province is a plain, so low that at Potsdam the surface of the river Havel is only 14·6 Prussian or about 15 English ft. above the level of the sea. The ground becomes slightly hilly toward Silesia. In general, the soil is sandy and naturally unfruitful. Without its numerous rivers and canals, B. would be one of the most barren tracts on the continent. The inhabitants are mostly Germans, mixed with French and Dutch colonists, who, however, are almost completely Germanized; and in the s. of the province, with people of Wend extraction. With the exception of 87,000 Rom. Catholics, and 41,000 Jews, they belong to the Prot. Church. Agriculture and the rearing of cattle afford occupation for a considerable number of the inhabitants. The manufactures are silk, cotton, wool, linen, sugar, leather, paper, metals, etc. There are numerous distilleries. B. is divided into the governments of Potsdam and Frankfurt—Berlin, the capital, forming a separate jurisdiction. In the beginning of the Christian era, B. was inhabited by the Suevi, afterward by Slavonic tribes. It was subjugated by Charlemagne 789, but again acquired independence under his weak successors, and remained free till 928, when Henry I. possessed himself of it. After passing through numerous changes in connection with the general history of the German empire—of which there is need to mention here only that Albert the Bear (q.v.) became the first Markgraf of B. 1142, and Frederick of Nürnberg, the first elector 1417—it became associated with the rise of the Prussian state into a monarchy under Frederick I., Elector of Brandenburg, 1701. See PRUSSIA. Pop. (1900) 3,108,554, with Berlin, 4,997,402.

BRANDENBURG (ancient *Brennaborch* or *Brennabor*): town from which the province B. is named; on the line of the Berlin and Magdeburg railway, about 37 m. w.s.w. of Berlin. The river Havel divides it into two parts, Old and New B., both surrounded with walls. On an island in the river there is a third quarter, containing the castle, cathedral, equestrian college, etc. The cathedral has a fine old crypt and several interesting antiquities. The Confession of B. was a formula of doctrine prepared by order of the Elector of B., who hoped thereby to harmonize the adherents of Luther with those of Calvin, and to end the disputes raised by the Augsburg confession (q.v.). The people of B., inclusive of the garrison, are engaged in the manufacture of woollen, linen, hosiery, paper, leather, beer, etc. Boat-building is also carried on to a considerable extent. Pop. (1880) 29,066; (1891) 37,817.

BRANDENBURG, New: walled town in the grand duchy of Mecklenburg-Strelitz, n. Germany; near the n. end of Lake Tollen, about 50 m. w.n.w. of Stettin. It is a beautiful town, with regular, broad, and well-built streets. The grand duke has a palace in the market-place. It has manufactures of woollen, cotton, damasks, leather, paper, tobacco, etc., beside corn-mills, oil works, and a trade in

hides and horses, and is altogether a very thriving place. Pop. (1880) 8,406; (1890) 9,323.

BRANDER, n. *bränd'ér* [see BRAND]: in *Scot.*, a grid-iron. BRANDERED, a. *bränd'érd*, grilled; broiled.

BRANDING: mode of punishment formerly inflicted on various classes of offenders. It was effected by the application of a hot iron, the end of which had the form which it was desired should be left imprinted on the skin. The canon law provided for B.; and in France till 1832 galley slaves were branded with the letters T F (*travaux forcés*). In England B. was formerly employed in the case of all *clergiabie* offenses by burning on the hand (see BENEFIT OF CLERGY); and with a view still further to repress theft and petty larceny, the 10 and 11 Will. III. c. 23, s. 6, provided that such offenders as had the benefit of clergy allowed them should be '*burnt in the most visible part of the left cheek nearest the nose.*' B. is no longer practiced in England, having been discontinued, except for military offenses, in the reign of George III. Till 1879 the punishment of marking with the letter D (deserter) or B C (bad character), by tattooing with needles and India ink, was used in the British army.—Upon large ranches in the w. United States B. is the common method of marking cattle so they can be identified by their owners.

BRANDIS. *brän'dis*, CHRISTIAN AUGUST: prof. of philosophy in Bonn: 1790, Feb. 13—1867, July 24; b. Hildesheim; son of J. D. Brandis, one of the most distinguished physicians of his time. Having studied philology and philosophy at Kiel and Göttingen, he began lecturing in the Univ. of Copenhagen, from which he removed to Berlin (1816). Here he was soon called to take part in the preparations for the great critical edition of the works of Aristotle, contemplated by the Berlin Acad. of Science, 4 vols. (Berlin, 1831–36); and with this object, spent several years, with Immanuel Bekker (q. v.), in exploring the chief libraries of Europe. In 1821, he resumed his academic career in the Univ. of Bonn, where he edited Aristotle's *Metaphysics* (vol. i., Berl. 1823), *Scholias in Aristotelem* (Berl. 1836), and *Scholias Græca in A. Metaphysicam* (Berl. 1837). He accepted, 1837, a call from the young king of Greece, and spent several years in that country as cabinet counselor. He published three volumes on Greece 1842. Other works are his history of Greek and Roman Philosophy (3 vols. 1835–66), and another work in the same field (1864).

BRANDISH, v. *brän'dish* [F. *brandissant*, brandishing—from *brandir*, to wave or shake a brand—from OF. *brand*, a sword: Manx, *brans*, dash: OF. *bransler*, to shake (see BRAND)]: to shake a brand or sword, then any other weapon; to move up and down; to shake as a spear or stick; to wave or flourish. BRAN'DISHING, imp.: N. act of one who brandishes. BRANDISHED, pp. *brän'disht*. BRAN'DISHER, n. one who.

BRANDLING: see PAR: SALMON.

BRANDON, *brän'dun*: town of Rutland co., Vt.; on the

BRANDON—BRANDY.

Central Vermont railroad, 13 m. n.n.w. of Rutland, 51 m. s. of Burlington. It is in B. township, about 1 m. e. of Otter Creek. B. has 1 weekly newspaper, about half a dozen churches, a graded school, 2 banks, several hotels, and manufactures of iron, wool, spools, and leather. In the neighborhood, there are mines of iron, coal, and lignite, and quarries of fine marble. Pop. of the township (1870) 3,571; (1880) 3,280; (1890) 3,310; (1900) 2,759.

BRANDON: town of growing importance in Manitoba, Canada; on the Canadian Pacific railway, below the junction of the Assiniboine and Little Saskatchewan rivers. It was founded 1881, and in the following year had over 1,500 houses. Pop. (1891) 3,778.

BRANDT, *brânt*, HERMAN CARL GEORGE: philologist: 1850, Dec. 15—————; b. Vilsen, Germany. He came to this country, and after graduating at Hamilton Coll. 1872, he pursued his studies at Auburn Theol. Sem. and in Göttingen and other German universities. Since 1882 he has been prof. of French, German, and philology in Hamilton Coll. Among his publications are: *German Grammar for High Schools and Colleges* (1884, 6th ed. 1892); *German Reader* (1889, 3d ed. 1892).

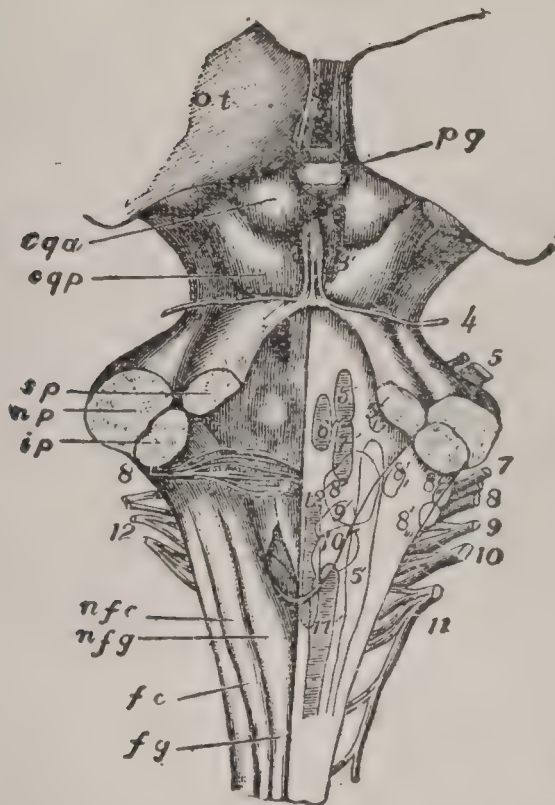
BRANDT, *brânt*, SEBASTIAN: 1458–1521: b. and d. Strassburg; author of a very popular German book, the *Narrenschiff*, or Ship of Fools. He studied law and the classics at Basel, where later he became one of the most approved lecturers. The Emperor Maximilian appointed him an imperial counselor. His Ship of Fools, a satire on the follies and vices of his times (Basel 1494), is not fine poetry, but is rich in good sense. It was translated into Latin by Locher (1497); and into English by Henry Watson, *The Grete Shyppe of Foolcs of the Worlde* (1517); partly translated and partly imitated by Alexander Barclay, *The Shyp of Folyes of the Worlde* (1508); and imitated by W. H. Ireland in the *Modern Ship of Fools* (1807). It has appeared in French also, and indeed in almost all European languages.

BRANDY, n. *brän'di* [formerly *brandy-wine*: Ger. *branntwein*, burnt-wine: Dut. *brandvijn*, brandy—from *brandt*, burnt; *wijn*, wine]: spirit distilled from wine; any strong spirit from other liquors. **BRAN'DIED**, a. *-dīd*, strengthened with brandy. Brandy is a term sometimes applied generically to all kinds of ardent spirits, but usually restricted to the liquid obtained by distilling the fermented juice of the grape: see **DISTILLATION**. The fermented liquors or wines employed for that purpose are various, and contain a proportion of alcohol (q.v.), which runs from 10 to 25 per cent. of their weight. The red wines generally are preferred, as containing most alcohol; but though they yield a larger amount of B. than the white wines, yet the latter afford a spirit which possesses a finer flavor and more agreeable taste. 1,000 gallons of wine give by distillation from 100 to 150 gallons of B., which varies in strength, but is generally diluted with water till

BRANDY.

it contains from 50 to 54 per cent. by weight of absolute alcohol. When originally distilled, B. is clear and colorless, and if wished to remain so, is received and kept in glass vessels; but when placed in wooden casks, the spirit dissolves out the coloring-matter of the wood, and acquires a light sherry tint, which is deepened by burnt sugar and other coloring-matter, intentionally added. The aroma of B. is due to the presence of more or less fusel oil (q.v.) accompanied by ænanthic ether (q.v.). The most famous B. is that distilled in Cognac, a dist. in the w. of France, from the choicest wines, but comparatively little of that sold under the name of *Cognac* comes from this district. A second-class B. is obtained from the red wines of Portugal, Spain, etc., as also from the refuse (*marc*) of the grapes left in the winepress, the scrapings of wine casks and vats, the deposits in wine-bottles, etc.; and very much of the B. sold as Cognac or genuine French B. is prepared at home from ordinary grain alcohol, by adding thereto Argol (q.v.), bruised French plums, some French wine-vinegar, a little good Cognac, and redistilling, when the spirit which passes over may be colored with burnt sugar, or by being kept in an empty sherry cask. Much preferable to these inferior decoctions is the B. produced in the United States from wines that are the product of American vineyards: this is readily obtainable pure. B. is the usual form in which alcohol is administered medicinally either internally or externally. It is distinguished from other ardent spirits by its light, cordial, and stomachic properties, and especially when set fire to for a minute or two, forming what is known as *Burnt B.*, it is valuable as a household remedy for diarrhea. B. is administered internally (1), in *mild cases of diarrhea*, unaccompanied by inflammation, but attended with griping pain, and the addition of nutmeg is productive of good; (2), as a *powerful excitant* for restoring patients who are suffering from suspended animation, and to relieve those who are laboring under fainting symptoms during an operation in surgery; (3), as a *stimulant and restorative*, where patients are much depressed in the ultimate stages of fever; and (4), as a *general stomachic stimulant* in indigestion after taking food, in the relief of flatulency and spasms of the stomach, and to check vomiting, especially in sea-sickness. In recent years it is not prescribed by physicians in so many cases as formerly. Externally B. is employed (1), in healing sores, and in stopping hemorrhage or the oozing out of blood from bruised or injured parts, and is generally applied by soaking linen or cotton with it, and laying the cloth on the part; and (2), in hardening the skin or cuticle over tender parts, the soles of feet which have been blistered, and the nipples of pregnant women for several days before delivery. The action of B. externally appears to be strictly chemical, as it coagulates the albumen of blood and otherwise tends to solidify flesh tissue.

In the United States (1890) the product of fruit brandy was 1,825,810 gals.; imports of foreign brandies, 461,257 gallons; in (1892) production 3,667,465 gallons, imports 333,234 gallons.



Brain.—Medulla Oblongata with Corpora Quadrigemina seen from behind (Cerebellum cut away) (Landois): *ot*, optic thalamus; *pg*, pineal gland; *cqa*, anterior corpora quadrigemina; *cqp*, posterior corpora quadrigemina; *sp*, superior cerebellar peduncle; *mp*, middle cerebellar peduncle, goes to pons Varolii; *ip*, inferior peduncle, or restiform body, goes to medulla oblongata and spinal cord; *fg*, funiculus gracilis, or column of Goll; *nfg*, nucleus of the funiculus gracilis; *fc*, funiculus cuneatus, or column of Burdach; *nfc*, nucleus of funiculus cuneatus. The lozenge-shaped area in the centre of the figure is the fourth ventricle. The numbers 4-12 indicate the superficial roots of the corresponding cranial nerves. The numbers 3'-12' their nuclei of origin.

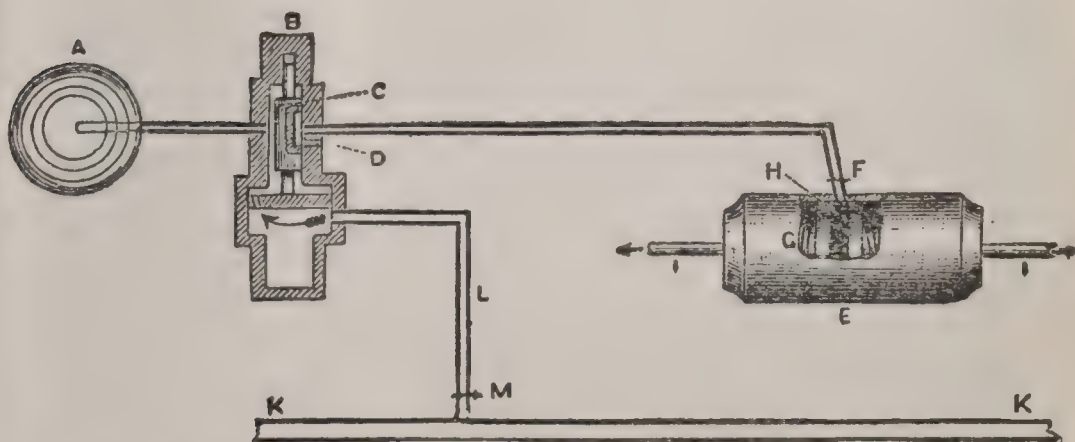


Diagram of Westinghouse Automatic Brake, showing arrangement for one carriage: A, Reservoir; B, Triple valve; C, Slide valve; D, Exhaust; E, Brake-cylinder; F, Release-valve; G, Spring; H, Pistons; I, Communication to brake-lever; K, Main pipe extending all along the train; L, Branch pipe; M, Cock.

BRANDYWINE CREEK—BRANK.

BRAN'DYWINE CREEK: stream 36 m. in length, rising in Pennsylvania, and flowing through Delaware, entering Christiana Creek, about 2 m. above its confluence with the Delaware River, immediately below Wilmington. In the war of independence, a battle, in which the British had the advantage, was fought on its banks, 1777, Sep.

BRANFORD, *brăn'fêrd*: town of New Haven co., Conn., 8 m. from New Haven, on the New York New Haven and Hartford railroad. Its manufactures are malleable iron fittings and locks. It has a savings bank, public buildings, 6 churches, and 8 common-school buildings; a weekly newspaper, and a waterworks co., chartered 1893. The borough received charter of incorporation from the state legislature 1893. Pop. (1900) town, 5,706.

BRANGLE, n. *bräng'gl* [F. *branler*, to shake: It. *branla*, a brawl: Gael. *brìonglaid*, confusion]: a squabble; a wrangle; confusion: V. to wrangle. **BRANGLING**, imp. *bräng'glìng*. **BRANGLED**, pp. *bräng'gld*: ADJ. confused; entangled.

BRANK, n. *brängk* [L. *brance*, a Gallic name for a certain bread-corn]: buckwheat.

BRANK, or **BRANKS**, n. *brängks* [Gael. *brangas*, an instrument formerly used for punishing scolds and slanderers; *brang*, a horse's halter: Ir. *brancas*, a halter]: in Scot. and OE., a halter; a bridle having on each side a piece of wood joined to a halter; an instrument of iron for scolds and slanderers, surrounding the head, with a gag for the mouth—formerly used in England and Scotland as an instrument of punishment in place of the stocks. In England it was often called the 'scold's bridle.' It seems to have come in place of the ducking-stool or cucking-stool (q.v.). 'I look upon it,' says Dr. Plot in his *Natural History of Staffordshire*, published 1686, 'as much to be preferred to the cucking-stool, which not only endangers the health of the party, but also gives the tongue liberty betwixt every dip: to neither of which is this at all liable; it being such a bridle for the tongue as not only quite deprives them of speech, but brings shame to the transgression, and humility thereupon, before it is taken off.' The B., in its simplest form, is a hoop of iron, opening by hinges at the sides, so as to inclose the head, and fastened by a staple with a padlock at the back; a plate within the front of the hoop projecting inward, so as to fit into the mouth of the culprit, and by pressing upon the tongue, be an effectual gag. There must have been difficulty in keeping such a hoop in its place; and so it received the addition of a curved band of iron, having a triangular opening for the nose, passing over the forehead, and so clasping the crown of the head that escape from it was scarcely possible. This may be regarded as the second form of the branks. In the third form, the curved band was hinged in the middle, and, passing over the whole head, was locked into the staple at the back of the hoop. The next addition seems to have been a second band crossing the first at right angles, so as to clasp the sides of the head, and keep the B.

still more firmly in its place. In its last most complicated shape, the B., by the multiplication of its hoops and bands, took the form of a conical cage or lantern, with a door behind opening by a hinge and fastened by a staple, the front being fashioned into a rude mask, with holes for mouth, nose, and eyes. An eye-witness, John Willis of Ipswich, on oath reported (about 1655) that in Newcastle he 'saw one Anne Bidlestone drove through the streets by an officer * * * holding a rope in his hand, the other end fastened to an engine called the branks, which is like a crown * * * with a great gap or tongue of iron forced into her mouth * * *, and that is the punishment which the magistrates do inflict upon chiding and scolding women.'



Branks.

When this curious instrument began to be used is unknown. It is found at Edinburgh 1567, at Glasgow 1574, also at Stirling 1600, and at Macclesfield, in Cheshire, 1623. One in the church of Walton-on-Thames, in Surrey, has the date 1633. In another, called 'the witches' bridle of Forfar,' dated 1661, the gag for the mouth is not a flat plate, but a long piece of iron with three sharp spikes. Of two examples in private custody in England, one has the date 1688, the other the crowned cipher of King William III. The B. was used at Langholm, Dumfriesshire, 1772: it was used still more recently at Manchester and at Macclesfield; and in the *Archæological Journal* for 1856, it is stated that 'at Bolton-le-Moors, in Lancashire, the iron bridle was still in use, not many years since, for the correction of immorality: it was fixed in the woman's mouth, and tied at the back of the head with ribands, and thus attired, the offender was paraded from the cross to the church steps, and back again.' Examples of the B. are in many museums in Britain.

BRANK'URSINE, or BRANC'URSINE: see ACANTHUS.

BRANNAN, *brăn'nan*, JOHN MILTON: military officer: 1819—1892, Dec. 17; b. in the District of Columbia. He graduated at the U. S. Milit. Acad. at West Point 1841, was engaged in the Canada border troubles 1841—2, and fought through the Mexican war, being severely wounded in the assault on the capital, and brevetted capt. He served on the frontier and against the Indians until 1861, when he was made brig.gen. U. S. vols. and was in command at Key West 1862. In 1863 he was in the Tennessee campaign, and was chief of artil. of the dept. of the Cumberland 1863, Oct. 10—1865, June 25. He fought at Missionary Ridge and in the Georgia campaign, and was present at the siege and surrender of Atlanta. He was brevetted maj.gen. U. S. vols. 1865, Jan. 23, and maj.gen. 1865, Mar. 13, for his services at Atlanta and through the war. He was mustered out of the vol. service 1866, May 3. He was made col. 4th artil. 1881, Mar. 15; and was retired 1882, April 19.

BRANKURSINE—BRASDOR'S OPERATION.

BRANK'URSINE, or BRANC'URSINE: see ACANTHUS.

BRAN-NEW [a corruption of BRAND-NEW]: bright as a firebrand; quite fresh; just made.

BRANNY, a. *brăn' nă*: see BRAN.

BRANNING, n.: preparing cloth for dyeing by steeping in a vat of sour bran-water.

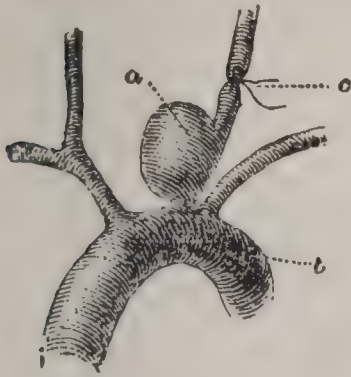
BRANT, JOSEPH (THAYENDANEGA): 1742–1807; b. on the banks of the Ohio: famous Indian, chief of the Mohawks. B. was grandson of one of the five sachems that produced such a sensation at Queen Anne's court 1710. He was Gen. William Johnston's secretary during the French and Indian war, aided the English against the colonists during the revolution, taking part in the Cherry Valley massacre, and other bloody outrages. After the war he exerted his powerful influence to preserve peace, gained some education, became a consistent Christian, and assisted to publish the gospel of Mark and a prayer-book in the Mohawk language. Col. Stone, of New York, published a history of his life.

BRANTFORD, *brant'ford*: town, railway center, and port of entry, in Canada; cap. of Brant co., Ontario. It is 24 m. w. of Hamilton, on the Grand river, which, in connection with a canal of two and a half m. in length, gives B. water-communication with Lake Erie. Beside churches representing ten different denominations, it has banks, two daily and two weekly newspapers, a fine court-house, a widows' and orphans' home, and manufactures engines and machinery, agricultural implements, iron-castings, brass, tin, japanned ware, stone-ware, sashes, etc. The Grand Trunk railway station and shops occupy 11 acres. Pop. (1881) 9,616; (1891) 12,753.

BRAS D'OR, *brâ dôr'* [Fr., arm of gold]: two *fiords* or channels, called the Big and the Little, about 25 miles long, opening from the Atlantic Ocean into a Little and a Big Bras d'Or Lake, in the island of Cape Breton, province of Nova Scotia. The larger channel is itself an ample harbor, and the lakes extend 50 miles. In a London admiralty map, 1776, these bodies of water are named Labrador, probably a mistake for *le bras d'or*. Labrador proper is a Spanish word, meaning laborer (perhaps referring to Indians carried away as slaves), though Weise derives it from the Portuguese for farmer; and a Basque whaler, named La Bradore, is said to have given his name to Bradore Bay in Newfoundland. The scenery of Cape Breton is diversified; and Bras d'Or Lake, which is a magnificent inland sea of great breadth and depth, abounds with valuable fish. A canal, a half-mile in length, connects it on the south with St. Peter's Bay, completing an inland water-route through the heart of Cape Breton.

BRASDOR'S OPERATION: for the cure of Aneurism (q.v.). In that disease a cure is effected by successive layers of the fibrine of the blood being deposited in the an-

eurismal sac; and surgeons procure this desired end by tying



Brasdor's Operation.

a, aneurismal sac; b, arch of aorta; c, artery, tied.

the artery at some point between the heart and the aneurism. In some situations it is impossible to do this, and therefore it was suggested by Brasdor that the course of the blood should be impeded *beyond* the aneurismal sac. This has now been tested by many operators, and most surgeons think favorably of it; but the same principle can be carried out by pressure without any cutting operation, as was shown by Mr. Edwards of Edinburgh, who succeeded in obliterating aneurisms

at the root of the neck by pressure applied to the arteries beyond the tumor.

BRASENOSE: one of the colleges of Oxford Univ., sometimes called King's Hall and College of Brasenose. It was founded, 1509, by the joint benefaction of William Smith, Bp. of Lincoln, at one time chancellor of the univ., and Sir Richard Sutton, Knight of Prestbury, Cheshire. The original foundation was for a principal and twelve fellows. Eight fellowships were added by various benefactors, 1522-86. B. college is also very rich in scholarships and exhibitions; particularly the Hulme exhibitions, 15 in number, of value £135 per annum each, besides £20 to be spent in books approved by the principal. The statutes of this college issued 1520, three years after the publication of Luther's theses, seem to have been framed by a person warmly attached to the Rom Cath. faith. They enjoin devotional exercises of a peculiarly popish character, such as repeating five times each day the Lord's Prayer in honor of the five wounds of the crucifixion, of the angelic salutation in honor of the five joys of the blessed virgin, etc. These devotions were in some cases enforced by fines and whipping. The origin of the name of the college is obscure. Legends say that it was originally 'Brewing-house,' which became corrupted into the present appellation; but Anthony Wood tells us that the college was 'near finished out of the ruins of several hostels, the chief of which was Brasenose Hall, so called, without doubt, from such a sign, which was in ancient time over its door, as other halls also had, viz., Hawk or Hieron Hall, Elephant, Swan, or Bull Hall.' The former theory is supported by the fact that, B. has always been celebrated for the excellence of its beer; the latter is borne witness to by a nose in brass, curiously fashioned, which is now conspicuous over the great gateway. Till lately, all the fellowships were confined to natives of certain counties. The senior fellowships, owing to the appropriations of fines to the seniors, were very valuable, about £500 per annum while the junior fellowships were about £80. By the commissioners appointed under 17 and 18 Vict. c. 81, many important alterations have been introduced. Five out of the twenty

fellowships have been suppressed, one being elevated to the endowment of a professorship, the remaining four to the establishment of additional scholarships. All the remaining fellowships have been thrown open. The senior fellowships have been limited to £300 per annum; the junior raised to £150. Various oaths, previously taken by the fellows, committing them to statements which were untrue, and binding them to duties impossible to be performed, have been by the same authority abolished. B. presents to 24 benefices, beside 29 pieces of preferment vested in the trustees of the Hulme exhibitions, for behoof of the exhibitioners. Though considered what is commonly called a 'good college,' B. has never attained much distinction in the 'schools.' In all probability this has been owing to the restrictions subject to which its endowments were so long administered. The number of names on the books is about 500; the number of resident undergraduates is considerably over 100.

BRASH, n. *brásh* [from *brush*: Sp. *broza*, chips: Gael, *bruis*, splinters: F. *brosse*, bushy ground]: in many parts of England, a mass of broken and angular fragments derived from the subjacent rocks; called also *Shivers*, or *Blaze*, or *Rubble*. They occasionally form the basement bed of alluvial deposits. At Canonmills, near Edinburgh, the boulder-clay rests on a bed of B., composed of fragments of the subjacent bituminous shale. B. is applied also to broken fragments; refuse; boughs of trees. CORN-BRASH, in *geol.*, a division of lower oolite.

BRASH, n. *brásh* [Gael. *brais*, a fit, a convulsion: Icel. *reisk*, infirm]: in *Scot.* and *prov. Eng.*, a fit of illness of any kind; an eruption on the skin; a sudden crash or development. WATER BRASH: see under WATER.

BRASH: see PYROSIS.

BRASIDAS, *brás'í-dás*: d. B.C. 422: bravest and most energetic Spartan general in the earlier years of the Peloponnesian war. Having distinguished himself (B.C. 431) by courage in relieving the town of Methone from a hostile attack, he was made one of the chief-magistrates of Sparta. In 424, he relieved Megara; and in his expedition to Macedonia, in the same year, to aid the states which had thrown off their allegiance to Athens, he was completely successful. In 422, B., who could obtain no reinforcements from Sparta, had to encounter with his helots and mercenaries the flower of the Athenian army under Cleon. A battle took place at Amphipolis, in which both Cleon and B. were killed, but the army of the former was completely beaten. B. was buried at Amphipolis, within the walls, and long after his death his memory was honored as that of a hero, by the celebration of yearly sacrifices and games. The Greek writers speak highly of B. Thucydides notices his eloquence, unusual in a Spartan, his justice, liberality, and wisdom, while Plato compares him to Achilles; but circumstances are not wanting to show that he was endowed with as much Spartan duplicity as Spartan courage.

BRASIL-WOOD—BRASS.

BRASIL-WOOD: see BRAZIL-WOOD. **BRASIL**, n. *bră-zîl'*, a pigment.

BRASS, n. *brās* [AS. *braes*, from being used in soldering: Icel. *bras*, solder; *brasa*, to be hardened by fire: Sw. *brasa*, to flame: It. *bronze*, burning coals; *bronz*, brass]: a compound of copper and zinc of a yellow color: OE. and slang for 'money'. **BRASSES**, n. plu. *-sez*, slabs or plates of brass on tombstones or monuments having engraved or raised figures on them, and inscriptions—much used in the middle ages. **BRASSING**, n. a coating of brass. **BRASSY**, a. *brās'si*, made of brass; like brass. **BRASSINESS**, a. *-sī-nēs*, the quality or appearance of brass. **BRASS-BAND**, an instrumental band. **BRASS-FOIL**, very thin beaten sheet brass, thinner than latten. It is also called Dutch gold. **BRASSAGE**, n. *brās'saj*, a fine formerly levied to defray the expense of coinage.

BRASS, n. *brās* [Gael. *bras*, rash, impudent; *braise*, rashness, impudence]: in *familiar slang*, impudence; shamelessness. **BRAZEN-FACED**, remarkably impudent. **A FACE OF BRASS**, a bold, impudent, set-one-at-defiance face—brass being taken as the symbol of impudence and self-will. *Note.*—This entry has been connected with the preceding one from an erroneous idea of its origin, and has taken its inflections from the same idea: for similar phrase see under **BRAZE**.

BRASS: an alloy of copper and zinc, largely used for household furnishings, certain parts of machinery, and various ornamental and useful articles. Technically, the term B. is extended to include compounds of copper and tin, as in *brass-ordnance*, the *brasses* or bearings of machinery, etc.; but such alloys of copper and tin, though styled *hard B.*, are more strictly varieties of **BRONZE** (q.v.); this notice is confined to the alloys of copper and zinc, or *yellow brass*. In ancient history, biblical and profane, frequent allusions are made to the employment of B. for musical instruments, vessels, implements, ornaments, and even gates; but as no mention is made of its mode of manufacture, or even of its composition, it is doubtful if the B. of the ancients was composed of copper and zinc. In the manufacture of B. on the large scale, two parts by weight of copper to one part of zinc are used, the zinc being one-half the weight of the copper; but alloys are made for particular purposes with less or greater proportions of zinc. Thus, where a material of more than ordinary tenacity is required, the zinc is reduced to one-fourth the weight of the copper; and where an alloy of a hard and brittle nature, possessing little resisting power, is wished for, the zinc is increased to an amount equal with the copper, or greater. In the manufacture of B., either of two processes may be followed. The direct method is to fuse the zinc in a crucible, and gradually add the copper in pieces. But this process is attended with disadvantage, owing to the volatile and oxidizable nature of zinc. The indirect method of forming B. is generally followed: it consists in heating in crucibles or pots a mixture of calamine (carbonate of zinc,

BRASSART—BRASSES.

ZnCO_3), charcoal, and thin pieces of scrap or grain copper. The calamine (q.v.) is generally first calcined or roasted to expel any traces of sulphur, then mixed with one-fourth of its weight of charcoal, and this mixture introduced into the crucible, after which the metallic copper is diffused through the mixture by being beaten in with hammers or mallets. The proportions employed are 3 parts of the mixture of calamine and charcoal to 2 parts of copper; and when introduced into a furnace, and subjected for 5 to 24 hours to a white heat, the charcoal reduces the calamine and separates the zinc, which, combining with the copper, forms 3 parts of B., containing about 2 of copper to 1 of zinc.

For ordinary purposes, B. is first cast into plates of about 100 lbs. weight, and $\frac{1}{4}$ to $\frac{1}{2}$ inch thick, which can be readily broken up, remelted, and cast in a mold of any desirable shape or size. The crude casting so obtained is generally screwed to a turning-lathe, and turned and bored into the required form with iron tools. B. is largely used for door-handles, window-shutter knobs, gas fixtures, etc. For the proportion of copper and zinc in the alloys resembling B., known as *gilding metal*, *Mannheim gold*, *pinchbeck*, *bath metal*, *Bristol brass*, *Muntz sheathing metal*, *spelter solder*, and *Mosaic gold*, see ALLOY.

BRASSART, n. *bräs'èrt*, also BRASSARD, n. *bräs'èrd* [F. *brassard*, an armlet or bracelet—from *bras*, an arm—from L. *brachium*, an arm]: in *plate armor*, the piece extending from the elbow to the shoulder; an armlet or bracelet; a band worn round the arm by the Geneva or Red-Cross ambulance-men, or as a sign of mourning. Brachiale was the ancient name for B. When the front of the arm only was shielded, the pieces were called demi-brassarts.

BRASSES, SEPULCHRAL: large plates of brass, or of the mixed metal called *latten* or *laton*, inlaid on slabs of stone, and usually forming part of the pavement of a church. The figure of the person intended to be commemorated was generally represented either by the form of the brass itself, or by lines engraven on it; though frequently an ornamented or foliated cross, with other sacred emblems, was substituted for the figure. Nor was the practice of imbedding them in the pavement uniform, as we sometimes find them elevated on what were called altar-tombs. It has been ascertained that the incised lines on these B. were originally filled with some black resinous substance, and that in the case of armorial decorations and the like, the field or background was often cut out by the chisel, and filled with some species of coarse enamel, by which means the appropriate heraldic tinctures were produced. In England, the brass was usually of the form of the figure, the polished slab forming the ground, and the ornaments, arms, inscription, etc., were inserted each as a separate piece. On the continent of Europe where the metal was more abundant, the B. were one long unbroken surface, formed of plates soldered together, on which were engraved all the objects represented, the portions of the plate not so occupied being

BRASSES.

ornamented by elaborate flower-work. B. are known to have been used for monumental purposes from a very early period, though there are no existing traces of them in England previous to the middle of the 13th c. There is reason to think, that if not imported from France, they were at first executed by French artists. Latterly, the art



Inlaid brass Monument of Eleanor Bohun, Duchess of Gloucester.
About 1400.

gained place in England, and English B., like English architecture, acquired a distinctive national character. The oldest complete specimen in England is that on the monument of Sir John d'Aubernoun, at Stoke Dabernon, d. 1277; probably the brass was executed shortly after that date. Next in antiquity are those of Sir Roger de Trumpington, d. 1289, and of Sir Richard de Buslingthorpe, 1290; the former at Trumpington in Cambridgeshire, the

BRASSEY.

latter at Buslingthorpe in Lincolnshire. In addition to the interest which they possess from their age, these B. are remarkable as still unsurpassed in beauty of workmanship and in the spirit of the design. As regards the earliest English B., it is further worthy of note that they are so similar, both in design and execution, as to lead to the conjecture that they are the work of one artist; while from their differing in many respects from the B. executed on the continent at the same period, it seems that this artist, if not an Englishman, worked exclusively in that country. In the following century (1325), on the brass of Sir John de Creke, at Westley Waterless, Cambridgeshire, the artist's mark is affixed by a stamp—regarded as a proof that his craft had attained importance, and that his services were frequently called into requisition. But in this case, as in every other, with one exception, the name of the artist has perished. The exceptional case is that of the brass which once covered the tomb of Bishop Philip, in the church of the Jacobins at Evreux, Normandy, where the inscription ended with the words ‘Guillaume de Plaili me fecit.’ Many of the B. executed in England in the 14th c. are probably Flemish; and in the churches at Bruges some remain which appear to be by the same hand with others which are found in England. There can be little question, indeed, that for this, as for most other departments of the arts, afterward successfully cultivated in England, that country was indebted to continental artists. Nor will it surprise those who know the results of recent archæological investigations in similar subjects, to learn that the artists of France and Flanders in their turn were debtors to those of the worn-out empire of the East. As in painting, sculpture, and architecture itself, so in the art of working in brass, the sparks of antique genius which smouldered in Byzantium were the means of kindling those which afterward burned so brightly in modern Europe. There are few subjects which have been more carefully illustrated in recent years than that of sepulchral brasses. Of engraved brasses there are not two hundred to be found on the continent. Rubbings of most of these have been made by Mr. Creeny for a work on the subject of foreign brasses. References to most of the leading works are in Parker's *Glossary of Architecture*, in an article in which their results have been carefully condensed. Of modern B. the most remarkable is that in the Cathedral at Cologne, engraved 1837, as a monument to the late archbishop.

BRASSEY, Lady ANNE: 1837–1887. Sept. 14, author; wife of Sir (now Lord) Thomas B.; daughter of John Allnutt. She lost her mother in infancy; and from the time that she could walk and talk, until her marriage, 1860, she was the inseparable companion of her father. As a girl she was one of the leading beauties of two London seasons. She was kind-hearted and charitable; and for her interest and zeal manifested in St. John's Ambulance Assoc. was made *Dame Chevalière of the Order of St. John of Jerusalem*. Lady B. was an extensive traveller, sailing on almost

every sea, and visiting every shore. Her style of writing is graceful, and her works are interesting. She published: *Voyage in the Sunbeam* (1877), her most popular work; *Sunshine and Storm in the East* (1878); *In the Trades, Tropics, and Roaring Forties* (1884), etc. She died and was buried in the Indian Ocean, 1,000 m. from land.

BRASSEY, *bras'si*, THOMAS: 1805–70: English engineer and railroad contractor of great ability and enterprise; b. Baerton, Cheshire, Eng. After receiving an ordinary education, he was, at the age of 16 years, apprenticed to a surveyor, whom he succeeded in business. After building parts of the Grand Junction and the London and Southampton railways, he contracted 1840, in partnership with another, to build the railway from Paris to Rouen. In a few years he held under contract, in England and France, some ten railways, involving a capital of \$180,000,000, and employing 75,000 men. In partnership with Betts and Peto, he now undertook the Grand Trunk of Canada, 1,100 m. in length, and including the great bridge at Montreal. His army of men were employed in nearly every part of Europe, South America, Australia, India, etc. B. amassed great wealth, but continued to be generous to the needy, and modest and simple in his taste and manners. Sir Arthur Phelps wrote his *Life* (1872).

BRASSICA, n. *brās'ī-kă* [L. *brassicā*; W. *bresych*, cabbage—said to be in allusion to the bunchy top]: genus of plants of the nat. ord. *Cruciferae* (q.v.), distinguished by a round and tapering 2-valved pod (*siliqua*), of which the valves have each only one straight dorsal rib and no lateral veins, the seeds globose, in one row in each valve, and the cotyledons (q.v.) conduplicate (folded laterally). The species are natives chiefly of the temperate and colder regions of the old world; several are British. A number of species are extensively cultivated, and are of great importance in an economical point of view, particularly the CABBAGE (q.v.) of which Kale, Borecole, Colewort, and different kinds of Greens, Savoy, Cauliflower, Broccoli, Brussels Sprouts, and Kohl Rabi are varieties; TURNIP (q.v.); RAPE (q.v.) (Colza, Coleseed), and NAVEW (q.v.). Among the British species is one, called Isle of Man Cabbage, or Wallflower Cabbage (*B. monensis*), which differs from all these, and in some measure departs from the strict generic character, in having the valves of the pod 3-nerved, and one or two seeds in its beak. It has deeply pinnatifid leaves. It is found on the sandy shores of the w. of Scotland, the Isle of Man, the n. of Ireland, etc. Sheep and oxen are very fond of it, and it has been suggested that it might be profitably cultivated for feeding cattle. Its peculiar adaptation to sandy soils ought to recommend it to attention. BRASSICA OLERACEA, *ōl'ēr-ā'sē-ă* [L. *olerācēūs*, herb-like]: the original species, whence all the varieties of cabbage, cauliflower, broccoli, and savoys have been obtained. BRASSYLIC ACID n. *brās-īl'ik ās'īd*, an organic acid of the oxalic acid series.

BRAST—BRAUN.

BRAST, *v.* *bräst* [see **BURST**]: in *OE.*, the pt. of *burst*; burst; broken.

BRAT, *n.* *brät* [*AS.* *brat*, a cloak, a clout: *W.* *brat*, a rag: *Gael.* *brat*, a cloth, a mantle—*lit.*, a clout]: a name given in reproach to a child; in *Scot.*, a child's bib; a large coarse apron; the rough or uneven scum or cream which rises on the surface of milk; the skin; the skin or clout on milk; the floatings of boiled whey.

BRATCHET, *n.* *bräch'ët* [*Sp.* *braco*, a pointer or setter dog: *Prov.* *brachet*; *Ger.* *bracke*; *O. H. G.* *braccho*, a hunting dog]: in *OE.*, a dog that follows the chase by scent; a slow hound; a female dog; a term of reproach. *Note.*—**BRATCHET** is probably only a diminutive of **BRACH**, which see.

BRATTICE, *n.* *brät'tis* [*OF.* *bretesche*, a small wooden erection or outwork: *Ger.* *brett*; *Dut.* *berd*, a plank or board: *Scot.* *brettys*, a fortification: *It.* *bertesca*, a kind of rampart]: a fence or wall of boards in a coal-mine, or around dangerous machinery; a partition, especially of plate iron or other material, dividing the main shaft of a mine into two passages to provide an upward and a downward ventilation; also spelled **BRETTICE**, **BRETAGE**: connected with **BARTIZAN**, which see.

BRATTLE, *v.* *brät'tl* [*Icel.* *bradr*, violent; an imitative word]: in *Scot.*, to make a clashing or clattering noise; to make a confused and harsh noise: in *OE.*, to thunder. **BRATTLING**, *imp.* *brät'tling*: *N.* a clattering confused noise; an uproar or tumult. **BRATTLED**, *pp.* *brät tld.*

BRATTLE, *brät'tl*, **THOMAS**: 1657–1713; b. Boston: merchant and author. He graduated at Harvard 1676. He published: *Eclipse of the Sun and Moon Observed in New England* (1704); and *Lunar Eclipse, New England* (1707). He wrote also in a private letter an account of the witchcraft delusion 1692, a manuscript now preserved among the *Massachusetts Historical Collections*.

BRATTLEBOROUGH, *brät'tl-bür-rō*: town of Windham co., Vt., on the w. side of the Connecticut river, a mile below the mouth of West river, 119 m. w.n.w. of Boston, The Connecticut River and Central Vermont railways afford excellent trading facilities. A bridge across the Connecticut connects it with New Hampshire. B. has a number of banks, 7 churches, a monthly periodical, and 3 weekly papers, a graded school, and is the seat of the Vermont Asylum for the Insane. The scenery around the town is picturesque. There are manufactures of carriages, parlor organs, furniture and machinery. Pop. (1880) 4,471; (1890) 6,862.

BRAUN, *brown*, **AUGUST EMIL**: 1809, Apr. 19—1856, Sep. 12; b. Gotha, Germany: eminent archeologist. He studied at Göttingen and Munich, where he made the friendship of his teachers, Schelling and Gerhard; with the latter he went to Rome 1833, and in a short time was made librarian, and subsequently sec. to the Archæological Institute. B. wrote many valuable works on art in German,

BRAUNITE—BRAVE.

Italian, and English. Among these are: *Il Giudizio di Paride* (Paris, 1838); *Kunstvorstellungen des geflügelten Dionysus* (Munich, 1839); *Griechische Mythologie* (Hamburg and Gotha, 1850); *Griechische Götterlehre* (Gotha, 1851-55); *Vorschule der Kunstmythologie* (Gotha, 1854, with 100 copperplate engravings); translated into English by Mr. Grant; and an admirable guide book, *Die Ruinen und Museen Roms* (Brunswick, 1854); translated into English, 1855. B. also executed numerous electrotype copies of ancient works of art.

BRAUNITE, n. *brown'it* [in honor of M. *Braun*, of Gotha]: an abundant ore of manganese; the sesquioxide of manganese, and protoxide, with 8 per cent. silica.

BRAUNSBURG, *browns'bërg*: walled town of e. Prussia, govt. of Königsberg, about 35 m. s.w. of the city of Königsberg. It is on the Passarge; contains a Rem. Cath. seminary and gymnasium; and has manufactories of woolen and linen, and considerable trade in yarn, grain, ship-timber, etc. Pop. (1880) 11,542; (1890) 10,851.

BRAUWER, or **BROUWER**, *brow'ër*, **ADRIAN**: 1608-40; b. Oudenarde (or, as some say, Haarlem): painter of the Flemish school. He was apprenticed to the artist Franz Hals, who made profitable use of his pupil's great talents keeping him in a garret like a prisoner, and making him work almost night and day, in painting small pictures, which Hals sold at very good prices. By the advice of a fellow-pupil, Adrian Van Ostade, young B. ran away from his hard taskmaster, and going to Amsterdam was astonished to find himself famous as a painter. He might soon have made a fortune; but his intemperance was so extreme, that, it is said, he would never apply himself to painting, while he could have credit or be supplied with liquor at a tavern. During the war in the Netherlands he went to Antwerp, where he was seized as a spy and taken to the citadel. Here, to prove himself a painter, he executed a sketch of the guards who had him in their custody. This picture was shown to Rubens, who immediately exclaimed: 'That is the work of Brauwer! no other artist could treat the subject in that style. B. was liberated through the interposition of Rubens, who gave him a lodging, supplied him with clothing and food and in every way acted as a generous friend. But the sole return for all this kindness was that B. secretly fled from the house of his patron, in order to renew his career of low dissipation. After visiting Paris, and failing to find work, he returned to Antwerp, where he died in the hospital, and was interred, at the cost of Rubens, in the Carmelites' Church. All B.'s paintings are marked by power and harmony of coloring, and clearness of chiaroscuro. They are pervaded by a jovial humor, and betray the favorite haunts and associations of the painter.

BRAVADO n. *bra-vă'dō* [Sp. *bravada* — from *bravo*, brave (see **BRAVE**)]: a boast or brag; a menacing display meant to frighten.

BRAVE, a. *brăv* [F. *brave*, brave, gay. It. *bravare*; F.

BRAVE.

braver, to swagger, to affront—from It. and Sp. *bravo*, a bravo, bullying: connected with BRAG, which see — *lit.*, swaggering or bullying]: bold; daring; courageous; gallant; magnificent or grand; in *OE.*, showy; well in health. BRAVE'LY, ad. -lī. BRAVERY, n. *brā'vēr-ī* [F. *bravoure*, valor, courage]: courage; heroism; fearlessness of danger. BRAVERY, n. [F. *braverie*, finery]: in *OE.*, splendor or magnificence; fine clothes. BRAVE, n. a man daring beyond discretion; an Indian warrior; in *OE.*, a boast; a defiance: V. to defy; to challenge; to encounter with courage; in *OE.*, to add splendor to; to make fine. BRA'VING, imp. BRAVED, pp. *brāvd.* BRAVELY, ad. *brāv'li*, in a brave manner; courageously; in *OE.*, splendidly. To BRAVE IT OUT [a corruption of BRAZEN IT OUT (see under BRAZE)]: to go on acting under a sense of conscious innocence, said of one esteemed guilty; more commonly, to act as a bravo in order to escape out of a difficulty; to lie impudently to get out of a scrape.—SYN. of 'brave, a.': bold; fearless; courageous; intrepid; undaunted; valiant; gallant; heroic; daring; valorous; dauntless; magnanimous;—of 'brave, v.': to defy; dare; challenge;—of 'bravery': courage; valor; heroism; intrepidity; dauntlessness; fearlessness; gallantry; manfulness.

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